Fullon
8 3/4 x 5 1/2
Outside
8 9/16 x 5 3/16

QK1
.J5952

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

VOL. XLVIII.

ILLUSTRATED WITH PLATES AND CUTS

N.Y. BOT. GARDEN
1910

LONDON:
WEST, NEWMAN & CO., 54, HATTON GARDEN.
1910.

SHOUT
SHARE
IT

LONDON:

PRINTED BY WEST, NEWMAN AND CO.,

HATTON GARDEN, E.C.

CONTRIBUTORS

TO THE PRESENT VOLUME.

ELEONORA ARMITAGE.
WILLIAM BARCLAY.
ARTHUR BENNETT, A.L.S.
E. N. BLOOMFIELD.
JAMES BRITTEN, F.L.S.
C. E. BRITTON.
N. L. BRITTON, M.D.
CEDRIC BUCKNALL.
J. B. CARRUTHERS, F.L.S.
MILLER CHRISTY, F.L.S.
R. H. COMPTON.
M. COWAN.
CECIL B. CRAMPTON.
A. A. DALLMAN, F.C.S.
F. H. DAVEY, F.L.S.
H. N. DIXON, M.A., F.L.S.
E. DRABBLE, D.Sc., F.L.S.
H. DRABBLE.
G. C. DRUCE, M.A., F.L.S.
S. T. DUNN, B.A., F.L.S.
W. FAWCETT, B.Sc., F.L.S.
ANTONY GEPP, M.A., F.L.S.
JOHN GERARD, S.J., F.L.S.
G. GOODE, M.A.
R. H. GOODE.
S. GREVES, B.Sc.
F. J. HANBURY, F.L.S.
W. P. HIERN, M.A., F.R.S.
A. R. HORWOOD.
A. BRUCE JACKSON.
B. DAYDON JACKSON, Ph.D., Sec. L.S.
FREDERICK KEEBLE, D.Sc., F.L.S.
H. H. KNIGHT.
W. H. LANG, D.Sc., F.L.S.
C. E. LARTER.
AUGUSTIN LEY, M.A.
E. F. LINTON, M.A.
G. LISTER, F.L.S.
M. A. G. LIVETT.
E. S. MARSHALL, M.A., F.L.S.
J. COSMO MELVILL, M.A., F.L.S.
W. F. MILLER.
SPENCER LE M. MOORE, F.L.S.
C. E. MOSS, D.Sc.
M. C. POTTER, Sc.D., F.L.S.
S. R. PRICE.
H. W. PUGSLEY, B.A.
J. F. RAYNER.
A. B. RENDLE, D.Sc., F.R.S.
BERNARD REYNOLDS.
H. J. RIDDELSDELL, M.A.
W. MOYLE ROGERS, F.L.S.
C. E. SALMON, F.L.S.
J. C. SHENSTONE, F.L.S.
W. A. SHOOLBRED, F.L.S.
ANNIE L. SMITH, F.L.S.
F. STRATTON, F.L.S.
H. TAKEDA.
JOHN TAYLOR.
H. H. THOMAS.
H. S. THOMPSON, F.L.S.
W. A. TODD.
R. F. TOWNDROW.
W. G. TRAVIS.
C. H. WADDELL.
JOHN WEATHERS.
H. F. WERNHAM, B.A.
G. S. WEST, D.Sc., F.L.S.
J. A. WHELDON, F.L.S.
J. W. WHITE, F.L.S.
F. N. WILLIAMS, F.L.S.
ALBERT WILSON, F.L.S.
A. H. WOLLEY-DOD.
E. A. WOODRUFFE-PEACOCK, F.L.S.

Directions to Binder.

Tab. 502	to face page	1
„ 503	„	65
„ 504	„	89
„ 505	„	145
„ 506	„	169
„ 507	„	297
„ 508	„	
Portrait of William Hadden Beeby	„	121
„ John Bennett Carruthers	„	217

The Supplement ('The British Roses') should be placed separately at the end of the volume.

Subscriptions to the Journal of Botany (16s. post free) for 1909 have now expired, and those for 1910 may be sent to West, Newman & Co.

No. 565 JANUARY, 1910 Vol. XLVIII

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

British Oaks. By C. E. Moss, D.Sc. (Plate 502) 1

"Nomina Rejicienda." By A. B. Rendle, D.Sc., F.R.S., and James Britten, F.L.S. 8

Notes on the Flora of South Devon. By Major A. H. Wolley-Dod. 10

Bristol Plants, 1909. By Cedric Bucknall, Mus. Bac., and James W. White, F.L.S. 16

Francis Blackwell Forbes. By James Britten, F.L.S. 19

Short Notes.—*Orchis maculata* var. *O'Kellyi*—*Festuca maritima* L. in Kent — *Tilia platyphyllos* Scop. in Brecon — *Dicranum Bergeri* Bland. in Caithness .. 22

Reviews:—

Botany of To-day. By G. F. Scott Elliott, M.A., &c. .. 23

Prodromus Floræ Britannicæ. By Frederic N. Williams .. 26

Fungi and how to know them: an Introduction to Field Mycology. By E. W. Swanton 30

Book-Notes, News, &c. 31

Supplement.—The British Roses (excluding *Eu-caninæ*). By Major A. H. Wolley-Dod.

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had price 1s. 6d. each.

AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

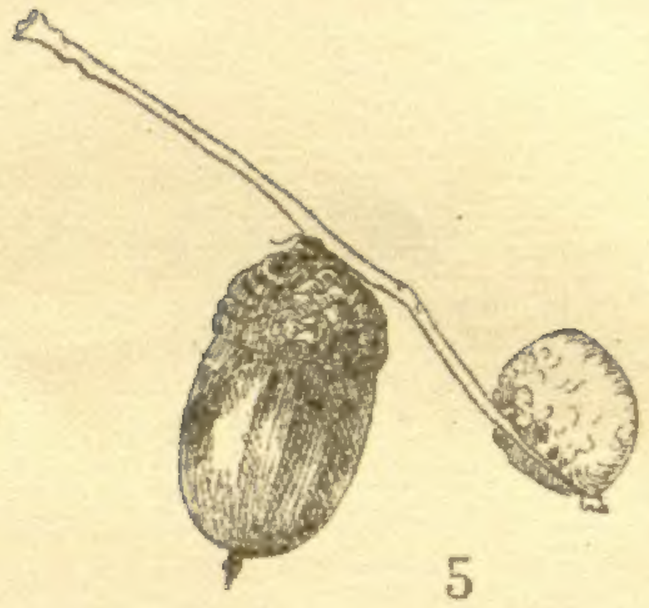
2 pages	25 copies		4s.	4 pages	25 copies		5s.	8 pages	25 copies		8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

1



5

2

4

3

6

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

BRITISH OAKS.

By C. E. Moss, D.Sc.

(Plate 502.)

Although British Oaks have been frequently discussed both by foresters and botanists, it has to be confessed that a considerable amount of doubt and uncertainty still prevails with regard to the status, distribution, and nomenclature of the Oaks in this country. Certain authorities have frankly confessed their inability to distinguish the British Oaks, and others have gone so far as to state that they cannot be distinguished specifically. The three recently issued catalogues of British plants illustrate the prevailing uncertainty. The British Museum *List of Seed-plants* mentions one species only; the *London Catalogue** gives one species made up of three varieties; while Mr. Druce's *List* gives two species and a hybrid. In giving two species, Druce follows Ray, Miller, Smith, Lindley, and other British authorities; and in giving two species and a hybrid, he follows a recent account by Elwes and Henry in vol. ii. of *The Trees of Great Britain and Ireland* (1907).

I am fully convinced that the native British Oaks may all be referred to *Quercus sessiliflora*, *Q. Robur* (= *Q. pedunculata*), and the hybrid between these species (*Q. Robur* × *sessiliflora*). There is perhaps just a possibility that the South European species, *Q. lanuginosa*, in one of its forms, is a native British plant. *Q. Cerris* occurs as a planted tree in woods in the south of England, as well as in plantations and park-lands; and it sometimes springs up from self-sown seed.

I. Quercus sessiliflora.

Quercus sessiliflora.

Q. Robur var. *β* Linn. Fl. Suec. ed. 2, 340 (1755).
Q. Robur var. *β* Huds. Fl. Angl. 359 (1762).
Q. Robur Mill. Gard. Dict. ed. 8, n. 1 (1768).
Q. Robur var. *α* Linn. in With. Bot. Arr. ii. 1084 (1787).
Q. Robur Roth Fl. Germ. i. 408 (1788).

---

* "Sessilifolia" in the *London Catalogue* (10th ed.) is obviously a misprint for "sessiliflora."

Q. sessilis Ehrh. Beitr. v. 161 (1790), *nomen.*
Q. Robur var. *sessilis* Martyn Fl. Rust. tt. 11, 12 (1792).
Q. sessiliflora Salisb. Prodr. 392 (1796).
Q. Robur Hull Brit. Fl. ed. 1, 212 (1799).
Q. sessiliflora Smith Fl. Brit. iii. 1026 (1804), including var. *β.*
Q. Robur Willd. Sp. Pl. iv. 450 (1805).
Q. sessiliflora Sm. Eng. Bot. t. 1845 (1808).
Q. sessiliflora Hull Brit. Fl. ed. 2, 280 (1808), including var. *β.*
Q. intermedia D. Don in Leighton Fl. Shropsh. 473 (1841).
Q. sessiliflora D. Don in Leighton, *loc. cit.*
Q. Robur subsp. *sessiliflora* var. *communis* DC. Prodr. xvi. 2, 8 (1864).

Of the indigenous British species, Linnæus (Sp. Pl. 1753) gives only *Q. Robur*; and there is no evidence to show that this included *Q. sessiliflora*, which he placed in another work (Fl. Suec. ed. 2, 1755) under *Q. Robur* as variety *β*. Miller (Gard. Dict. ed. 8, 1768) appears to have been the first post-Linnean botanist to regard the two as distinct species: he, however, erroneously applied the name *Q. Robur* to the sessile-fruited species; and in this error he was followed by Roth, Willdenow, and others. Hudson (Fl. Angl. 1762) simply followed the *Flora Suecica*; whilst Martyn gave the varietal name *sessilis* to the Sessile-fruited Oak. If, therefore, the latter tree be regarded merely as a variety, it should be cited under Martyn's name. As Ehrhart's name *Q. sessilis* (adopted by Druce in his *List*) appears without any description, it would seem that Salisbury's name *Q. sessiliflora* is the first valid specific name for this tree; and under this it is almost always quoted in Continental works.

There is no specimen in the Linnean Herbarium named *Q. Robur β*; but the specimen there named *Q. Esculus* is apparently *Q. sessiliflora*. The name *Q. Esculus* is used by Linnæus (Sp. Pl. 996), but appears to have dropped out of the quoted synonymy of modern systematists: his descriptive phrase is taken from Royen (Fl. Leyd. Prodr. 80): the only synonym quoted by Linnæus is from Bauhin's *Pinax*, 420; and this provides no clue as to the meaning to be attached to the name. The fact that a specimen of *Q. sessiliflora* in the herbarium of Linnæus is there named *Q. Esculus* is rendered of doubtful value by the further fact that the plant named *Q. Esculus* among the specimens from Cliffort's garden—the *Hortus Cliffortianus* is not, however, in this case quoted by Linnæus—in the British Museum Herbarium is *Q. lanuginosa*. Curiously, there are specimens of *Q. lanuginosa* in the Botanic Gardens at Cambridge and in the Glasnevin Gardens at Dublin named *Q. Esculus*, but by whom is doubtful. Hence the name *Q. Esculus* Linn. remains an enigma, and Salisbury's name *Q. sessiliflora* must be accepted.

The plant is best distinguished by the presence of stellate, *i. e.*, branched, hairs on the under surface of the leaf, and by the absence of the two leaf-auricles which characterize *Q. Robur*. As Watson (1883) pointed out, the length of the peduncles is variable in the British Oaks; and the attempt to distinguish the tree by

the character indicated by the trivial name frequently results in error. On the other hand, the stellate or branched hairs may always be found if a lens magnifying ten or twelve diameters is used. There are two forms, or perhaps varieties, of the tree, which may often be distinguished in this way. The more hairy form (? the var. β of Smith) has branched hairs which are large and numerous, especially along the junction of the lower half of the midrib and the blade. In the less hairy form the hairs are quite short, appressed, and usually bifid; and the leaves appear glabrous to the naked eye or even under a lens of low magnification. The latter form is almost invariably described as glabrous

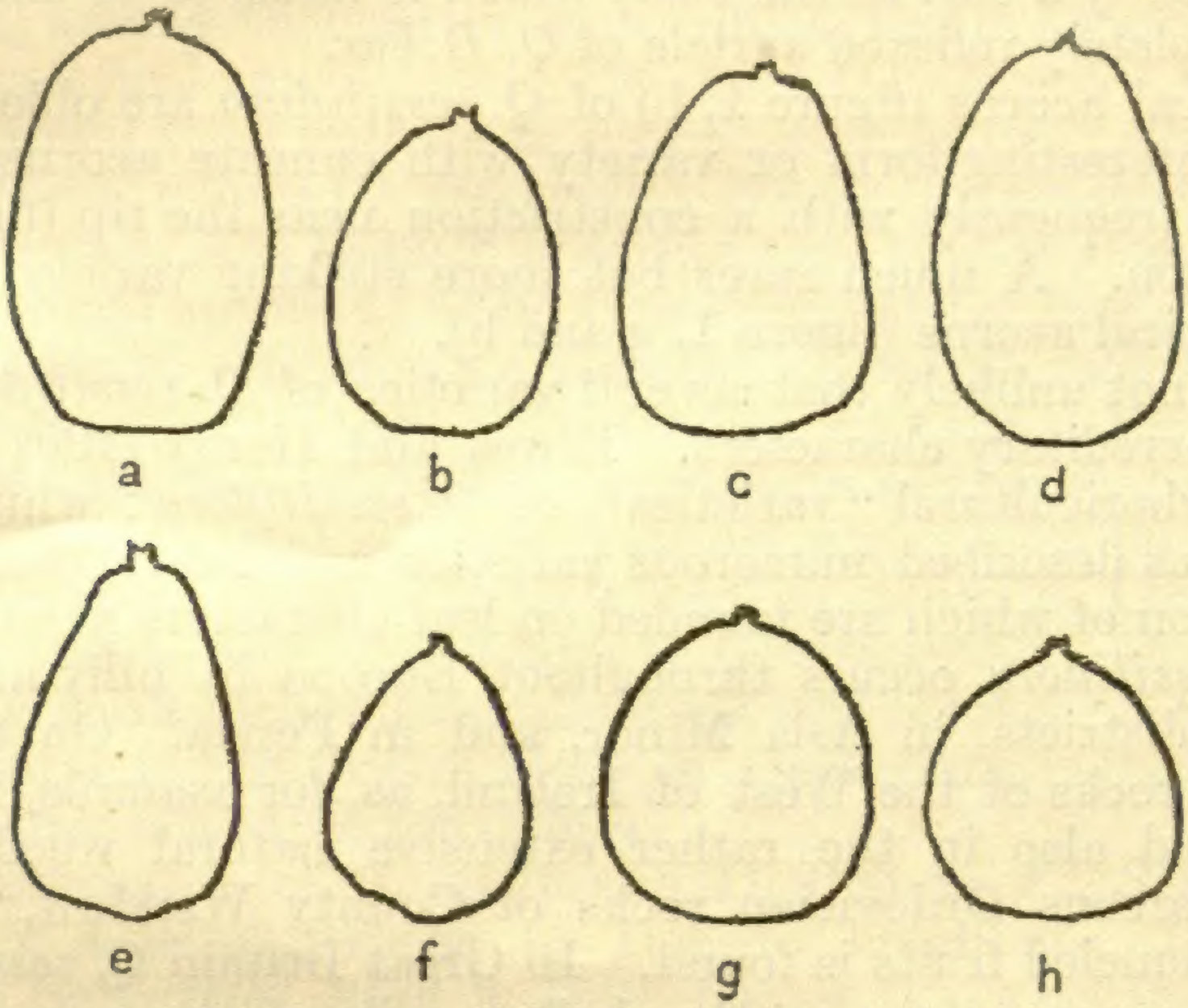


Figure 1.—Acorns of British Oaks.

a. *Q. Robur.* b, c. *Q. sessiliflora.* d. *Q. Robur* × *sessiliflora.*
e, f. *Q. sessiliflora*, var. g, h. *Q. sessiliflora*, var. (All natural size.)

in the floras. Many floras state that the leaves of *Q. sessiliflora* are "hairy in spring," thus conveying the erroneous idea that they are glabrous at other times of the year. As a matter of fact, however, the multiple hairs may be seen by careful observation in any specimen at any time of the year, even on fallen dead leaves in mid-winter and in old herbarium specimens. Very rarely the veins on the upper surface of the leaf possess multiple hairs also. In the possession of multiple hairs, *Q. sessiliflora* resembles the great majority of other species of *Quercus*.

Other characters are usually attributed to *Q. sessiliflora*; but, whilst many of them are trustworthy in the majority of cases, they are sometimes subject to considerable variation. For example, whilst the fruits of *Q. sessiliflora* are typically sessile or subsessile, there is a form or variety whose peduncles range in length up to two inches or even more. This form is abundant in some of the wetter districts of the hills of the north and west of Britain and of Ireland. As it occurs in primitive woods in which *Q. Robur* is not found, the variation cannot be due to hybridism.

Again, whilst the petioles of *Q. sessiliflora* are typically long, it is by no means unusual to find trees all of whose petioles are short; and near Wastwater, in the Lake District, whole woods are composed of this form. In this case, also, the question of hybridism does not enter into the case. A practised eye will easily detect in the leaves of *Q. sessiliflora* more regular veining and lobing, and shallower sinuses, than in those of *Q. Robur*; and the leaf of the former species is also typically flatter and broader above the middle; but to beginners, at least, such characters are of an elusive nature. The leaves are sometimes cuneate at the base, and at other times broad at the base; and in the latter form there is frequently a curl at the base, which is liable to be mistaken for the completely reflexed auricle of *Q. Robur*.

Typical acorns (figure 1, b) of *Q. sessiliflora* are oblong-ovate; but an interesting form or variety with cuneate acorns (figure 1, e and f), frequently with a constriction near the tip (figure 1, e), is common. A much rarer but more striking variety possesses subspherical acorns (figure 1, g and h).

It is not unlikely that several varieties of *Q. sessiliflora* occur having hereditary characters. Elwes and Henry (1907) mention fifteen arboricultural "varieties" of *Q. sessiliflora*; whilst Lasch (1857) has described numerous varieties and subvarieties, a large proportion of which are founded on leaf-characters alone.

Q. sessiliflora occurs throughout Europe in hilly and mountainous districts, in Asia Minor, and in Persia. On the metamorphic rocks of the West of Ireland, as, for example, in Connemara, and also in the rather extensive natural woods on the non-calcareous Ordovician rocks of County Wicklow, the form with peduncled fruits is found. In Great Britain *Q. sessiliflora* is the commoner species on the shallow soils of the non-calcareous hills of the north and west, where it frequently occurs to the total exclusion of *Q. Robur*. On the rocks of the Millstone Grit and Coal-measure series of the Pennines, for example, *Q. sessiliflora* is the dominant tree in the woods below 1000 ft. (302 m.). On the other hand, *Q. Robur* is, on the same rocks, often quite rare and confined to situations where it has clearly been planted, such as hedgerows, park-lands, plantations, and those portions of the woods which contain planted trees. In the south and east of England, *Q. sessiliflora*, as an indigenous species, occurs on dry sandy and gravelly soils, such as the Hastings Sand, the Lower Greensand, the sandy Reading Beds, and the glacial sands and gravels. Its upper altitudinal limit in the North of England occurs at about 1200 ft. (363 m.); but the tree becomes rare at about 1000 ft. (302 m.).

It is possible that the hairs of the leaves of *Q. sessiliflora* are of service in checking excessive transpiration, and may perhaps be related to the fact that the species frequently inhabits more exposed places than its ally, *Q. Robur*. The absence of hairs from young seedlings of *Q. sessiliflora* is perhaps not to be wondered at, as the carpet of a wood where the seedlings normally germinate is not a situation where excessive transpiration occurs.

Quercus intermedia D. Don.

It is necessary to consider the claims of *Q. intermedia* D. Don. Many British botanists (*e. g.*, Druce, 1908) and foresters (*e. g.*, Henry, 1907) do not recognize the validity of this segregate, nor is it recognized by Continental botanists. The combined characters ascribed by Don (in Leighton's *Flora of Shropshire*, 1841) to his *Q. intermedia* are insufficient to distinguish it from *Q. sessiliflora*. So confused indeed are Don's descriptions of the British Oaks that if his *Q. intermedia* be regarded as valid, the plant *Q. sessiliflora* itself has no existence in fact. Again, British field botanists who use the name are totally unable to agree (*teste* herbarium specimens) among themselves as to which plants should receive Don's enigmatical appellation. The name *Q. intermedia* has been used by several other authors in several other senses; and one, at least, of these names (*Q. intermedia* Boenn. in Reichenbach Fl. Germ. Excurs. i, 177, 1830–2) is earlier than that of Don.

There would appear to be no type-specimens of Don's in existence; and hence Leighton's specimens named *Q. intermedia* by Don become virtually types. Such specimens exist in the University Herbarium at Cambridge, as well as others so named by Leighton himself; and all these I should without hesitation refer to *Q. sessiliflora*. Several, in fact, were so named by Leighton in the first instance, and altered later to *Q. intermedia*. In all these cases, Leighton's earlier determinations were correct. A specimen from Leighton in the British Museum Herbarium, named by him *Q. intermedia*, is also *Q. sessiliflora*.

The description of *Q. intermedia* D. Don in *Fl. Shropsh.* is taken from a letter written by Don to Leighton. Leighton, writing to Babington, April 9, 1840, quotes Don's original letter; and this letter of Leighton, preserved in the Cambridge University Herbarium, puts an interpretation on Don's creation different from that held by many British botanists. "I am rather inclined," writes Don, "to adopt the opinion of those who regard our British Oaks as varieties only; but a series of careful observations and experiments are requisite to settle this question in a satisfactory manner. In the meantime, I consider your Nesscliffe Oak to have an equal claim as a distinct species with the other two. The three have long been distinguished, yours being what is termed the Durmast Oak, and consequently Smith's var. β of *Q. sessiliflora*. As it possesses characteristics intermediate between the other two, the specific name *intermedia* may be justly applied to it; and the following characters will serve to distinguish the three, whether as species or varieties." Then follow the descriptions of the three as given in Leighton's *Flora*. Don's statements that the Oak in question is Smith's variety β of *Q. sessiliflora*, and that it is intermediate between *Q. sessiliflora* and *Q. Robur* are contradictory and mutually destructive; and Don does not state which characteristics of his plant are of an intermediate nature.

Babington, in the first seven editions of his *Manual*, followed Don's description in an abbreviated form, but in the eighth edition

added to the confusion by altering "petioles long" to "petioles short." This misdescription is perpetuated in the ninth edition of the *Manual* by Messrs. Groves, and also in Hooker's *Student's Flora* (third edition). Don's description is also totally inapplicable to the Hybrid Oak (*Q. Robur* × *sessiliflora*), to be described later on.

I have discussed this matter at some length, as Don's name has led to great confusion in this country; and it is well to make it clear that his description of *Q. intermedia* applies to no plant which is worthy of recognition as a species or even a constant variety or form.

II. Quercus Robur.

Quercus Robur Linn. Sp. Pl. 996 (1753) *non* Linn. herb.
Q. Robur Linn. Fl. Suec. ed. 2, 340 (1755), excluding var. *β*.
Q. femina Mill. Gard. Dict. ed. 8, n. 2 (1768).
Q. pedunculata Ehrh. Beitr. v. 161 (1790), *nomen*.
Q. Robur var. *pedunculata* Martyn Fl. Rust. t. 10 (1792).
Q. longæva Salisb. Prodr. 392 (1796).
Q. Robur Smith Fl. Brit. iii. 102 (1804).
Q. pedunculata Willd. Sp. Pl. iv. 450 (1805).
Q. germanica Lasch in Bot. Zeit. xv. 413 (1857).
Q. Robur subsp. *pedunculata* var. *communis* DC. Prodr. xvi. 2, 8 (1864).

There can be no doubt that Miller erred in referring the name *Q. Robur* to the Sessile Oak. The reference of Linnæus in Sp. Pl. to Bauhin's *Quercus cum longo pediculo*, especially as he makes no reference to Bauhin's *Quercus latifolia mas quæ brevi pedunculo*, is sufficient evidence of this; and there are many other confirmatory facts. The specimen from Cliffort's garden in the British Museum Herbarium—the *Hortus Cliffortianus* is referred to by Linnæus (*l.c.*)—is the Peduncled Oak. Further, Linnæus in another work (Fl. Suec. ed. 2, p. 340) not only refers to the type *Q. Robur*, Bauhin's *Q. cum longo pediculo*, but gives a var. *β*, which by the reference to Bauhin's *Quercus . . . brevi pedunculo* is obviously the Sessile-fruited Oak. Hudson, too, six years earlier than Miller, adopted this view. Not only is Miller's reference to *Q. Robur* incorrect, but his account of the British distribution of his own *Q. Robur* (i. e., *Q. sessiliflora* Salisb.) is wrong, as pointed out by Martyn (*op. cit.*). Hence the name of *Q. Robur* for the Peduncled Oak is unassailable.

A curious mistake has occurred with regard to the specimen named *Q. Robur* in the Linnean Herbarium. This is neither *Q. Robur* nor *Q. sessiliflora*, but looks like some American species, possibly *Q. alba* L. The sheet on which the specimen occurs is marked "K" by Linnæus. Dr. B. D. Jackson informs me that this signifies that the specimen was collected by one of the earliest pupils of Linnæus, Pehr Kalm, who travelled in many parts of the world, including America, and supplied specimens to Linnæus. It may be pointed out that if the name *Q. Robur* is not accepted for the Peduncled Oak, Miller's name, *Q. femina*,

must be adopted. The name *Q. pedunculata* of Ehrhart appears without description, and cannot possibly be made the starting-point of a species; and besides, Ehrhart's name is later than Miller's. If the view of the *London Catalogue* be taken that this Oak is a variety of *Q. Robur*, Martyn and not Ehrhart should be cited as the authority of the varietal name.

Q. Robur may always be identified by the presence of two completely reflexed auricles at the base of the under surface of each leaf, and by the absence of the multiple hairs which characterize the under surface of the leaves of *Q. sessiliflora*. Commonly, the leaf of *Q. Robur* is broad at the base, when the auricles are comparatively large and conspicuous; but some forms of the plant possess leaves which are cuneate at the base, and on such leaves the auricles, though perfectly formed, are small and often almost hidden by the petiole.

The acorns (figure 1, a) are usually borne on slender glabrous peduncles, which are often an inch or more in length. The peduncle, however, is not infrequently only half an inch long, when it is usually stouter, and aborted towards the distal extremity. In *Q. sessiliflora* the peduncles when present are usually hairy towards the base. Rarely the fruit of *Q. Robur* is subsessile or sessile. In shape the acorns are usually oblong or cuneate-oblong, but sometimes comparatively long and narrow. Several of these fruit-forms or fruit-varieties are constant on the same tree from year to year.

The leaves usually possess short but distinct petioles; but trees with subsessile or sessile leaves are prevalent in some localities. Sessile leaves, too, usually occur on shoots which arise from cut stumps of the old trees, or from adventitious buds low down on the trunks of uncut trees. It is usual for some of the conspicuous leaf-veins, especially the lower ones, to terminate at the bases of the sinuses. As Greville pointed out in 1844, "it is impossible to define the general outline or *circumscriptio* of the leaf," as the size and shape of the leaf are very variable. In general, however, it may be said that in *Q. Robur* the sinuses of the leaf are deeper, narrower, more acute, and more irregular than in *Q. sessiliflora*. The lobes, too, of the leaves of *Q. Robur* are, as a rule, more irregular in size and shape, and are somewhat out of the general leaf-plane. Some of the leaf-variations are possibly hereditary; and certainly some are constant on certain trees from year to year. Mr. Henry (*Trees of Great Britain*, ii. 284) mentions eleven arboricultural "varieties" of *Q. Robur*; and Lasch (*op. cit.*) describes a very large number of varieties and sub-varieties.

Multiple hairs appear to be quite absent from all parts of *Q. Robur*. This is important; for, as already stated, most species of *Quercus* possess such hairs, although glabrous species occur in several of the subgeneric divisions. *Q. alba*, possibly the plant named *Q. Robur* in the Linnean Herbarium, is also glabrous.

It is difficult to diagnose the habit of the two British Oaks, as this may be modified by the method of cultivation; but, on the whole, *Q. Robur*, when grown in the open, has frequently a flatter crown, a shorter bole, and more tortuous branches than *Q. sessiliflora*.

There has been and there is still much dispute as to which of the two species yields the more valuable timber.

Q. Robur occurs throughout Europe except in the extreme north and north-east, and in a few districts in the extreme south, and extends to Asia Minor. It is less common in hilly regions than *Q. sessiliflora*. In Ireland the distribution of the two species has not been worked out, but probably *Q. Robur* is the more widespread tree. It is abundant in Garryland Wood, County Clare, on the Carboniferous Limestone. In Great Britain, it is the typical species of the lowlands. It is, in fact, the most abundant tree in all natural or semi-natural woods on deep soils such as the Triassic and Jurassic clays and marls, the Weald Clay, the London Clay, the "Clay with Flints" overlying the Chalk, the calcareous glacial clay of East Anglia, and the non-calcareous glacial clay of the North of England and of the Midlands, and it even occurs on wet peat in the "carrs" of East Anglia. Similarly, the tree is abundant in woods on deep dry soils, such as the Lower Greensand, where it often occurs side by side with *Q. sessiliflora* and the hybrid. On some such sandy soils, *Q. Robur* is dominant in woods which have a heathy ground flora. The natural and semi-natural woods over the various limestone strata, such as the Carboniferous Limestone and the Oolitic limestones, are usually dominated by the common Ash (*Fraxinus excelsior*); but frequently, especially in the more lowland of such woods, Oaks also occur, usually *Q. Robur*, or, rarely, both species. The hedgerow trees all over the lowlands of the country are *Q. Robur*; but in hilly districts, where stone fences usually take the place of hedgerows, specimens of *Q. sessiliflora* are by no means uncommon in the few hedgerows that exist.

(To be concluded.)

"*NOMINA REJICIENDA.*"

By A. B. Rendle, D.Sc., F.R.S., and James Britten, F.L.S.

The List of generic names—which, though not the earliest, are for special reasons to be retained—appended to the Rules of Nomenclature adopted at the Vienna Congress in 1905, has not met with universal acceptance. There can be no question that its adoption by the Congress without critical examination was due to the pressure of business and the limitation of time; and its obvious incompleteness is by some held to justify its non-acceptance. We, however, in common with those who consider that the Rules should be observed, have accepted the List as authoritative, and have been guided by it in our various publications.

We therefore regard with apprehension the proposal to amplify the List which Dr. Janchen has distributed among botanists, and which he proposes to submit for adoption to the approaching International Congress at Brussels. He also suggests as necessary a complete revision of the List by the Congress of 1915, and that a supplementary list should be discussed at each succeeding Congress.

It must not be forgotten that the main object of the revision of the Rules, to the drawing up and discussion of which so many botanists devoted much time and trouble five years ago, was the insuring of uniformity; and it is on this account that this List has been so largely adopted. Proposals, however, such as those suggested by Dr. Janchen, implying as they do the entire revision of the List and further alterations every five years, seem to us to strike at the root of the principle of uniformity. As a matter of detail, if the List is to be completely revised in 1915, it can hardly be worth while to add to it now; and this seems in itself sufficient reason for opposing the adoption of the proposed additional list, the results of which may be merely temporary.

We are aware that the question of future additions to the List was left open at the Vienna Congress, but in our opinion the coming Congress should decide at an early stage in its proceedings whether or no the List may be extended.

To us the reasons against any extension of the original List appear conclusive.

As we have already pointed out, it affects the principle of uniformity. Moreover, during the interval between successive Congresses, workers who follow the principle of priority laid down by the Rules will be uncertain how far the names which they adopt are likely to be permanent. The establishment of new combinations is not a mere matter of bibliography but often involves careful botanical research; in the absence, however, of any security as to the permanence of the results, botanists will not care to spend time on such investigations, although the value of these from a historical point of view can hardly be doubted.

Many workers who have followed the List, sometimes against their personal inclination, will naturally resent additions which reduce the names they have given to the rank of synonyms—a rank to which such names may be at once degraded by the first seeker after notoriety who, without any investigation, botanical or literary, forms a new combination for which he will be cited as the authority. Nor is this an imaginary situation. Take the case of *Limonium*—a genus to which Mr. C. E. Salmon has been and is devoting much conscientious work, and for which Dr. Janchen proposes to restore the name *Statice*. As Mr. Druce has shown (see Journ. Linn. Soc. xxxv. 72), Hill corrected Linnæus's error of uniting Tournefort's two genera *Armeria* and *Statice* under the latter name, and reconstituted them as genera; and it is to be regretted that Willdenow, in 1809, should have neglected this restoration, and used *Armeria* in the opposite sense. By the List of 1905 the law of priority in this instance was not superseded, and in accordance therewith the correct application of the names was followed in Messrs. Groves's edition of Babington's *Manual* and in the three catalogues of British Plants which have appeared since 1905; it is also followed by Schinz & Keller in their *Flora der Schweiz*, 1909, and doubtless by other authors. It seems an extremely arbitrary proposition to suggest the reversal of names which have come into such general use, and which with the full

authority of the Rules have been adopted by the most recent worker on the genus. It would be easy to select from Dr. Janchen's list other names to the substitution of which similar objection might be taken—for example the supersession of the now generally accepted *Castalia* and *Nymphæa* by *Nymphæa* and *Nuphar* respectively.

We are fully aware that the 1905 List is far from complete, and of this Dr. Janchen's proposed additions afford abundant testimony. Works which are quoted in the List and which were therefore presumably carefully considered by Dr. Harms when compiling it, such as those of Adanson & Boehmer, supply a large proportion of Dr. Janchen's proposed additions.

But the same objection of incompleteness may be urged against Dr. Janchen's own list. We can hardly imagine a more flagrant case of omission from the List of "nomina conservanda" than that of *Welwitschia*, a name which had been in universal use almost from the time of the discovery of the plant, and that not only in botanical but in general literature. We do not propose to discuss his list in detail, but we note that he states that in drawing it up he consulted the *Genera Siphonogamarum* of Dalla Torre and Harms. A very slight examination of Dr. Janchen's proposed "nomina conservanda" suffices to show that in one order—*Orchidaceæ*—there are at least two important omissions, if names at present in general use are to be maintained; and we cannot doubt that a detailed examination would yield many more instances.

It may be added that even on strictly botanical grounds Dr. Janchen's list is open to criticism. In the same order, "*Sturmia* Reichb. in Mossler, Handb. ed. 2, ii. (1828) 1576" is entered as a "nomen conservandum" for the plant generally known as *Liparis Loeselii*; Reichenbach's genus, however, is precisely equivalent to Richard's *Liparis*—the name being given merely because *Liparis* was already in use in Zoology. Reichenbach (*l. c.*) gives no generic diagnosis of *Sturmia*, but refers to his Plant. Crit. iv. p. 39 (1826), where he first insisted on its identity with *Liparis*, and states that it includes fifteen species, referring to Sprengel (Syst. iii. 740) where thirteen are described. If *Liparis Loeselii* is to be regarded as the type of a distinct genus, it seems clear that *Pseudorchis* S. F. Gray, Nat. Arr. Brit. Pl. ii. 213 (1821), which Dr. Janchen places among "nomina rejicienda," must be retained for it.

We trust that the coming Congress will endorse conclusions which seem to us essential to the first principles of a uniform nomenclature.

NOTES ON THE FLORA OF SOUTH DEVON.

By Major A. H. Wolley-Dod.

The following plants were observed by me during a visit to Paignton in the month of August, and when no other station is mentioned, the notes refer chiefly to the region for about two miles south and west of that town. The list contains no new

county records and very few critical plants. The reason for the absence of the latter is mainly that my attention was taken up in hunting for roses, so that I had no time to devote to other critical plants. For the same reason I may have overlooked many stations for interesting though not critical species, and the lateness of my visit allowed the majority to have passed the flowering stage, and indeed to have dried up altogether. I may perhaps have erred in including so many common species, but I have endeavoured to do so only in the case of species which are not universally common in Britain.

All the species mentioned as growing at Teignmouth, Teign Estuary, or between Teignmouth and Newton Abbot were found in company with the Rev. E. S. Marshall, who was the first to see many of them.

Clematis Vitalba L. Abundant.

Thalictrum minus L. (*T. collinum* Wallr.). Berry Head, in considerable quantity.—*Ranunculus Lenormandi* F. Schultz. Near Haytor Rocks.—*R. sceleratus* L. Frequent.—*R. sardous* Crantz. Marsh between Newton Abbot and Teignmouth. A small subglabrous form, but not *R. parvulus* L.—*Aquilegia vulgaris* L. Cholwell; near Holne Chase.

Fumaria Borœi Jord. Frequent. Also one or more of its smaller flowered varieties.

Arabis hirsuta Scop. Yelberton; on a wall by roadside to Anstey's Cove.—*Sisymbrium Thalianum* Gay. Near Shorton Mill.—*Brassica oleracea* L. Anstey's Cove.—*B. nigra* Koch. Very common.—*Diplotaxis tenuifolia* DC. Casual. A plant or two on waste ground at Teignmouth.—*D. muralis* DC. Roadsides at Paignton.—*Coronopus didymus* Sm. Common.—*Lepidium ruderale* L. A rubbish-heap plant at Teignmouth.—*L. Smithii* Hook. Scabbacombe; Goodrington. Seen occasionally elsewhere, but stations not noted.—*Cakile maritima* Scop. A plant or two on Goodrington Beach. Not seen elsewhere.—*Raphanus maritimus* Sm. Teignmouth; Berry Head; Slapton.

Reseda lutea L. Roadside on hill above Paignton—*R. luteola* L. Berry Head; Galmpton.

Helianthemum Chamæcistus Mill. Downs near Fishcombe Point; also at end of railway viaduct near Broad Sands; Galmpton. Appears scarce, but perhaps overlooked, being past flowering.—*H. polifolium* Mill. Anstey's Cove; plentiful at Berry Head.

Viola palustris L. Haytor.—*V. hirta* L. Plentiful, Berry Head and Fishcombe.

Dianthus Armeria L. Hilly field between Goodrington and shore.

Saponaria officinalis L. Near Goodrington Retreat; Teignmouth; Galmpton. Not looking native anywhere.—*Silene maritima* With. Very abundant.—*S. maritima* × *latifolia*. Slopes towards Broad Sands, just intermediate.

Silene anglica L. Slapton.

Stellaria umbrosa Opiz. Orchard near Goodrington.

Spergularia marginata Kittel. Teignmouth. — *S. rupestris* Lebel. Between Newton Abbot and Teignmouth; Scabbacombe; near Goodrington.

Tamarix gallica L. More or less naturalized by shore in several places.

Hypericum Androsæmum L. Frequent and general.—*H. calycinum* L. By the Dart above Galmpton, naturalized from an adjacent garden.—*H. hirsutum* L. Apparently uncommon, but probably overlooked. Near Berry Pomeroy Castle; by the Dart above Galmpton.—*H. montanum* L. Common, at least on the limestone.—*H. elodes* L. Common in bogs.

Lavatera arborea L. Mudstone Bay; Anstey's Cove.—*Malva rotundifolia* L. Goodrington; Stoke Fleming.

Radiola linoides Roth. Near New Bridge.—*Linum angustifolium* Huds. Very common.

Geranium rotundifolium L. Frequent near the shore, as at Broad Sands; Galmpton; old road to Slapton Sands.—*G. lucidum* L. Common. — *G. columbinum* L. Common. — *Erodium cicutarium* L'Hérit. var. *glandulosum* Bosch. Very common on or near the shore. The type not seen, but some of the forms simulate *E. moschatum* for which species I at first mistook them. The latter is, however, said to be frequent, though I cannot vouch for it myself.—*E. maritimum* L'Hérit. Frequent, perhaps common, but easily overlooked.

Ulex Gallii Planch var. *humilis* Planch. What I take for this variety, though it appears to be nothing but a wind-swept form, and therefore dwarf and compact, occurs in plenty on the only two of the higher tors I visited, *viz.* Haytor and Meldon Hill.—*Ononis repens* L. Abundant near shore.—*Medicago* sp. An unidentified member apparently of the *sativa* group, but slender and decumbent, was found by Mr. Marshall between the road and rail between Newton Abbot and Teignmouth. Its flowers were small, yellow, solitary or in pairs, and the pods falcate. It looked indisputably native. — *M. denticulata* Willd. Between Newton Abbot and Teignmouth.

Melilotus officinalis Lam. Slopes near Mudstone Bay, looking native.

Trifolium arvense L. Broad Sands; railway near Goodrington; Sharkham Point. All with longish cylindrical very whitish-hairy heads.—*T. glomeratum* L. A plant or two in a desiccated condition attached to other material coming, I am almost certain, from a small sandy field over Goodrington Beach. It may be frequent, but the small clovers were everywhere dried up to sticks.—*T. elegans* Savi. Marshy fields between Newton Abbot and Teignmouth. — *T. fragiferum* L. Broad Sands; Goodrington Marsh; Teign Estuary.—*Anthyllis vulneraria* L. Frequent all along the coast.—*Lotus tenuis* Waldst. & Kit. Between Newton Abbot and Teignmouth. An unusually bright yellow form.—*Hippocrepis comosa* L. Near Berry Head; Anstey's Cove. Only leaves seen, perhaps overlooked elsewhere.—*Lathyrus latifolius* L. By railway between Newton Abbot and Teignmouth, one patch,

quite naturalized.—*L. sylvestris* L. In great quantity on banks and cliffs by the shore from Torquay to Scabbacombe and no doubt beyond, but not explored.

Spiræa Filipendula L. From Churston to Berry Head, in suitable places; Yalberton Tor.—*Agrimonia Eupatoria* L. A very large form, sometimes 4 ft. high, is quite common, but I did not see *A. odorata* Mill.—*Poterium Sanguisorba* L. Very common.—*Rosa.* I have not determined my gatherings critically, so at present can only make general remarks. I was struck by the comparative infrequency of the genus as compared with most British counties, and still more by the entire absence, in so far as my observations go, of the hairier-leaved species; *R. coriifolia*, and the more hairy segregates of *R. dumetorum* I saw none of, nor did I meet with a single representative of the *Borreri*, *Glauca*, or *Eglanteria* groups. The bulk of the species were varieties of the *Lutetianæ*, the *Dumales* (or *Transitoriæ*, i. e. intermediates between *Dumales* and *Lutetianæ*) and *Stylosæ* coming next in about equal frequency. *R. leucochroa* Desv., of the last-mentioned group, seemed to be quite the commonest of any single species. *R. arvensis* and forms of *R. micrantha* were tolerably frequent, *Andegavensis* quite rare, and *Tomentosæ* only represented by two bushes, one of which was almost certainly *R. scabriuscula* Sm.

Saxifraga tridactylites L. Wall at Paignton.

Sedum anglicum Huds. Common. — *S. rupestre* L. Berry Head.

Eryngium maritimum L. Goodrington Beach; Slapton; Broad Sands.—*Conium maculatum* L. Very common.—*Smyrnium Olusatrum* L. Roadside near Apton.—*Apium graveolens* L. Saltmarshes, Teignmouth to Slapton. — *Carum segetum* Benth. & Hook. fil. Teign Estuary; rail-side near Goodrington Southdown. — *Sison Amomum* L. Abundant. — *Fœniculum vulgare* L. Common, and looks native. — *Crithmum maritimum* L. Very common by shore, also in railway cuttings near Goodrington, two or three hundred yards from the shore. — *Œnanthe Lachenalii* C. Gmel. Broad Sands; Teign Estuary. — *Silaus flavescens* Bernh. Yalberton. — *Caucalis nodosa* Scop. Near the sea in many places.

Viburnum Lantana L. Common.

Rubia peregrina L. Abundant.—*Galium Mollugo* L. Very abundant, practically filling the whole hedgebanks in most of the lanes.—*G. Vaillantii* DC. Waste ground by estuary at Teignmouth, a casual.—*Asperula odorata* L. Awsewell Woods, plentifully.—*A. cynanchica* L. Berry Head.—*Sherardia arvensis* L. var. *hirsuta* Baguet. Specimens from Churston and the slopes by the viaduct near Broad Sands probably belong to this variety, from their unusual hairiness. A single specimen of var. *Walravenii* Wirtg., with subobsolete calyx-teeth, was noticed near the latter station.

Kentranthus ruber DC. Very common on walls, but never far from gardens. — *Valerianella olitoria* Poll. Occasional, as at

Kingswear, but no other exact station noted. No other species seen.

Dipsacus sylvestris Huds. General but not, I think, common. —*Scabiosa Columbaria* L. Very common near coast.

Aster Tripolium L. Teignmouth; Goodrington; Broad Sands; Slapton.—*A. Linosyris* Bernh. Between Berry Head and Mudstone Bay, abundantly. — *Erigeron acris* L. Railway embankment between Newton Abbot and Teignmouth.—*Inula squarrosa* Bernh. Very common.—*Matricaria suaveolens* Buch. Teignmouth; Goodrington; Paignton.—*Tanacetum vulgare* L. Not at all common? Lane near Scabbacombe. Seen elsewhere, but stations not noted. — *Artemisia Absinthium* L. Woodhuish; Slapton Sands, in great quantity.—*A. maritima* L. Between Teignmouth and Newton Abbot.—*Senecio Cineraria* DC. Anstey's Cove, two plants.—*Carlina vulgaris* L. Very common.—*Carduus tenuiflorus* Curt. Frequent near the shore.—*C. nutans* L. Common.—*Cnicus acaulis* Willd. Berry Head.—*Serratula tinctoria* L. Anstey's Cove; Berry Head; Mudstone Bay. A very dwarf form at Scabbacombe. — *Cichorium Intybus* L. Frequent or common about Paignton, but not, I think, general.—*Picris hieracioides* L. Common.—*P. echioides* L. Common.—*Hieracium umbellatum* L. Near Ashburton. No other *Hieracium* (except *H. Pilosella* L., which is common) seen in the whole of the part visited.—*Lactuca Serriola* L. By the railway at Newton Abbot, and Teignmouth.—*Tragopogon pratense* L. General, but not common. I am not sure whether this or *minus*; I never saw opened flowers.

Wahlenbergia hederacea Reichb. Common on the moor, not seen elsewhere.

Limonium vulgare Mill. Teign Estuary, abundant in one spot, accompanied by var. *pyramidale* Druce, and a very different looking very slender form which may be distinct. A fourth form, with smaller very condensed panicle, may also be distinct. Mr. C. E. Salmon, who kindly named my *Limonia* for me, has not yet identified it.—*L. binervosum* C. E. Salmon. With the last at the Teign Estuary; Mudstone Bay.

Glaux maritima L. Locally abundant. Dart and Teign Estuaries; Broad Sands.—*Anagallis arvensis* var. *carnea* (Schrank). Southdown Cliffs. Seen also elsewhere.—*A. tenella* Murr. Common in bogs on the moor.—*Samolus Valerandi* L. Goodrington Marsh; Broad Sands; Scabbacombe; Teignmouth.

Ligustrum vulgare L. Very common and general.

Blackstonia perfoliata Huds. Seen in one or two places, but no exact record kept.—*Centaurium umbellatum* Gilib. With white flowers plentifully, almost to the exclusion of those with normal colour, near Scabbacombe Bay.—*C. pulchellum* Druce. Frequent. Often seen in a dwarf compact form (f. *compacta* Wettst. ?), also with most of the corollas 4-partite.— *Gentiana Amarella* L. Fishcombe Point.

Cynoglossum officinale L. Slapton Sands.—*Myosotis scorpioides* L. Frequent, but not so common as *M. cæspitosa* Schultz.—*Lithospermum officinale* L. Galmpton; Broad Sands. Perhaps

frequent but overlooked elsewhere.—*Echium vulgare* L. Frequent on or near the coast.

Calystegia Soldanella Br. Goodrington Beach; Slapton Sands.—*Cuscuta Epithymum* Murr. Lane near Churston Church; top of Meldon Hill, abundant.

Verbascum virgatum Stokes. Thinly scattered over the whole region visited, from Teignmouth to Slapton. Most frequent about Woodhuish, and apparently native in many of its stations.—*Linaria Cymbalaria* Mill. Abundant on every wall, and on many hedge-banks. Appears quite native. — *L. spuria* Mill. Near Berry Head.—*Veronica Anagallis-aquatica* L. Afton; Goodrington Marsh.

Pinguicula lusitanica L. Haytor; near Holme Chase. Probably common on the moor.

Mentha rotundifolia Huds. Common and general about Woodhuish and Scabbacombe. Not seen elsewhere.—*M. Pulegium* L. var. *erecta* Syme. Slapton Sands. — *Calamintha Acinos* Clairv. Only seen by railway near Broad Sands.—*C. montana* Lam. Very common, here and there passing into var. *Briggsii* Druce as at Southdown, and near Maldon, but the variety seems hardly worth distinction. — *Melissa officinalis* L. Totnes-Paignton road, near Longcombe; below Berry Pomeroy Castle.—*Salvia Verbenaca* L. Sandy field over Goodrington Beach.—*Scutellaria galericulata* L. By the Dart above Galmpton.—*S. minor* Huds. Abundant in wet places on Haytor and Meldon Hill. —*Melittis Melissophyllum* L. Woods near Berry Pomeroy Castle; Awsewell Woods.—*Galeopsis Ladanum* L. Cornfields near Broad Sands. — *Ballota nigra* L. With white flowers about Paignton.—*Plantago lanceolata* L. var. *capitellata* Koch. Berry Head.

Corrigiola littoralis L. Slapton Sands. Only seen in one spot, but it exists there in thousands.

Chenopodium polyspermum L. Abundant at Slapton Sands, but only one to three inches high.—*C. murale* L. Elbury Farm; Teignmouth.—*C. rubrum* L. Slapton Sands, a very dwarf form; by the Dart above Galmpton.—*C. Bonus-Henricus* L. Goodrington.—*Beta maritima* L. Common by the shore.—*Atriplex portulacoides* L. Teign Estuary. Not observed elsewhere. — *Suæda maritima* Dum. Frequent by the shore.

Polygonum Raii Bab. Goodrington Beach; near Teignmouth. Mr. Marshall has some slight doubt as to the correctness of this latter determination, but can suggest no other name. There were two distinct forms, one showing a decided approach to *P. agrestinum* Jord. in habit and colour, but its very large fruit and rather long pedicelled flowers make it nearer *P. Raii* Bab. —*P. amphibium* L. Goodrington Marsh; Slapton Lea; near Yalberton.—*Rumex pulcher* L. General near shore, but not very frequent.

Euphorbia Paralias L. Abundant on Slapton Sands, not seen elsewhere. — *E. portlandica* L. Frequent on rocky slopes by the sea.

Humulus Lupulus L. Occasional in hedges, probably as a

relic of former cultivation.—*Parietaria ramiflora* Moench. Abundant and general.

Myrica Gale L. Between Bovey and Haytor.

Spiranthes spiralis Koch. Slopes near Broad Sands.—*Orchis pyramidalis* L. Frequent about Goodrington and Yalberton.

Iris fœtidissima L. Abundant.

Tamus communis L. General, but not, I think, very common.

Ruscus aculeatus L. Woods about Galmpton. Seen in another station, but no record kept.—*Allium vineale* L. var. *bulbiferum* Syme. In some quantity by the Teign between Newton Abbot and Teignmouth, mixed with and passing into var. *compactum* (Thuill.).—*Scilla autumnalis* L. In great quantity between Berry Head and Mudstone Bay.

Juncus maritimus Lam. Goodrington Marsh; Teign Estuary. —(*J. acutus* L., stated in *Fl. Devoniensis* to grow at Goodrington Marsh, does not exist there now, the marsh having been much restricted and drained in recent years.)—*J. subnodulosus* Schrank. Marsh at Broad Sands. — *Luzula sylvatica* Gaud. Abundant, Awsewell Woods.

Typha angustifolia L. Slapton Lea.

Triglochin palustre L. Goodrington Marsh.—*T. maritimum* L. Goodrington Marsh; Teign Estuary.

Ruppia rostellata Koch. Teign Estuary.

Scirpus lacustris L. Slapton Lea. — *S. Tabernæmontana* C. Gmel. Goodrington Marsh.—*Rhynchospora alba* Vahl. Melldon Hill. — *Carex pallescens* L. Awsewell Woods. — *C. distans* L. Teign Estuary; Goodrington Marsh. — *C. extensa* Good. Teign Estuary.

Agrostis nigra With. Goodrington Marsh.—*Poa compressa* L. Churston Churchyard; valley below Berry Pomeroy Castle.—*Glyceria distans* Wahlb. Waste ground at Teignmouth.—*Festuca rigida* Kunth. Very common on walls, &c.—*F. rottbœllioides* Kunth. Broad Sands. — *F. Myurus* L. On a wall at Goodrington. — *F. bromoides* L. Broad Sands. No doubt frequent elsewhere but not noticed.

Asplenium Adiantum-nigrum L. Very common.—*A. marinum* L. Anstey's Cove; Goodrington Rocks; Berry Head; Scabbacombe. — *A. Trichomanes* L. Abundant. — *Ceterach officinarum* Willd. Churston, near church and near old windmill; Afton; Galmpton; Woodhuish; Scabbacombe. — *Lastræa montana* T. Moore. Awsewell Woods. — *Osmunda regalis* L. In great abundance in Awsewell Woods.

BRISTOL PLANTS, 1909.

By Cedric Bucknall, Mus. Bac., & James W. White, F.L.S.

Since our last notes were published in the Journal for October, 1908, there have been found in the area of the Bristol coal-field a fair number of apparently new local species, and several fresh

stations for plants that are of interest on account of their rarity in the district.

New vice-comital records are preceded by an asterisk.

**Myosurus minimus* L. This unobtrusive species had been repeatedly searched for unsuccessfully before the spring of 1908, when Miss Hill and Miss Peacock, hunting in company, found a good quantity of it in a corn-field on alluvial clay not far from the village of Portbury, North Somerset. The plant is said to seldom stay long in one place; and even at Portbury, although this year still fairly abundant in the same large enclosure where it was first observed, it no longer grew on the ground where it was discovered the preceding spring. The author of the *Flora of Somerset* stated that he had never found the plant himself, nor had he seen a Somerset specimen (see Journ. Bot. 1909, 272).

**Fumaria confusa* Jord. Is not recorded for West Gloucestershire either in Topogr. Bot. or its Supplement, although a corn-field locality for the plant was given in the *Flora of the Bristol Coal-field*, part i., issued 1881. No other station in the vice-county came under our notice until this year, when a couple of specimens were found on allotment ground between Shirehampton and Avonmouth.

**Lepidium campestre* R. Br. var. *longistylum* More. Plentiful on one part of Ivory Hill, near Frampton Cotterell, and more sparingly on Yate Common—both in West Gloucester. A very distinct form that simulates *L. heterophyllum*. Stems many from the root, very leafy; style twice as long as the notch; pouches scaly. It agrees well with Rouy & Foucaud's description of their var. *foliosum*.

Polygala calcarea F. Sch. Hitherto the nearest stations for this milkwort have been those at Maiden Bradley (v.-c. 6), and on the Cotteswolds about Stroud (v.-c. 34). Between them there intervened a space of some forty miles—with Bath and Bristol near the centre—from which the plant had never been reported with certainty. Mr. F. Samson brought it last May from a hill-side on oolite between Bath and Combe Hay, where there is plenty. How those brilliant patches of beautiful bright blue flowers escaped recognition by the keen Bath botanists of past generations is a mystery. But several persons (including one of ourselves) now seem to remember having noticed them in former years without realizing their significance.

Mœnchia quaternella Ehrh. This is one of the rarities which flourished on Brandon Hill, Bristol, in the old days when "Queen Elizabeth's drying ground" was covered with flowers and brush-wood, and no decent person dare walk on it after dark! Specimens from the hill are extant, gathered from sixty to seventy years ago; but probably the plant had disappeared before Swete's time, for he makes no mention of it in his *Flora Bristoliensis*. No other locality was known in Gloucestershire until last May when it was found on Yate Common (v.-c. 34) fairly plentiful on bare sandy ground about an old excavation (see Journ. Bot. 1909, 272).

**Spiræa Ulmaria* L. var. *denudata* Boenn. Ditch-bank by a field-path from Stoke Gifford to Hambrook, West Gloucester! *F. Samson.* A variety that some of us do not regard as important. Still, such as it is, it had been repeatedly searched for in this district without result, and it has no place in the *Flora of Somerset.* Absence from so large an area is peculiar, when we hear that the plant is to be found whenever wanted around the upper waters of the Severn.

**Rubus Drejeri* G. Jensen. A large clump or two on Durdham Down, Bristol, West Gloucester. The spot is near Sneyd Park, where there survives a little of the original downs vegetation, now almost entirely trampled out. When first noticed, a relation with *R. mucronatus* suggested itself, but there were obvious objections. On sending a good representative set to the Rev. W. Moyle Rogers he reported: "I call this good *Drejeri*, agreeing admirably with specimens from Friedrichsen and Gelert from Schleswig."

**Cratægus oxyacanthoides* Thuiller. This, again, we have often looked for, but to our knowledge it was never found in our area before this autumn when Miss Livett detected two trees on Tickenham Moor, North Somerset. This scarcity in the West Country is remarkable in view of the frequency in eastern England. No mention is made of the plant in the Somerset, Dorset, or Plymouth lists, and only two bushes appear to be known in Herefordshire; while many stations are reported for it in Kent, Surrey, and Middlesex.

**C. monogyna* Jacq. var. *splendens* Druce. One tree on a low cliff towards Walton-by-Clevedon, *Miss Livett*! Another in the wild woodland of Chelvey Batch. Both in North Somerset. A most handsome form, with fruit at least four times heavier than that of the type; average dimensions 15 mm. by 12 mm., against 9 by 8 in type *monogyna*. It is odd to see whitethorn boughs bending under the weight of haws just as those of orchard trees often do when apple crops are good.

Pyrus latifolia Syme. Some trees of this species have been long known on the Somerset side of the Avon opposite Clifton, but its presence at Clifton itself seems never to have been suspected. Symonds Yat was, we believe, the only locality in West Gloucester. A sprig with a leaf and a few berries was picked up by one of us on the turf of Clifton Down in September, and this led to the discovery of an old tree well concealed on an adjacent wooded slope of steep rock. Children had been gathering and scattering the fruit.

**Polygonum minus* Huds. In shallow boggy pits on Yate Common, West Gloucester. New to the county. There are many of these pits on the common, but the plant was detected in only two.

Scirpus fluitans L. With the last species on Yate Common, in shallow pits that are moist and boggy at bottom but contain no standing water. The sedge is widely distributed throughout the country, being present in ninety-one out of the hundred and twelve British counties and vice-counties. Yet, prior to this

autumn, we had no evidence of its occurrence in Gloucestershire other than the note "Thwaites MS." under v.-c. 34 in Topogr. Bot. The absence of swamp and bog from the greater part of the county may, of course, be an explanation. As Yate Common might well come within the ten miles radius from Bristol worked by Thwaites, the probability is that he got his plant there, but no specimen seems to have been preserved. Our plant grows in close tufts that are entirely barren. It is said by Mr. Arthur Bennett to be the var. *terrestre* Meyer in *Chloris Hannoverana*, 1836, p. 600; and he opportunely refers us to Report B. Ex. Club, 1868 (1869), containing a note by Hewett C. Watson on a similar barren state collected in Ditton Marsh, with an attached interesting comment by Boswell Syme. Mr. Bennett has compared our specimen with Watson's and can see no difference. He draws attention to an evident creeping habit possessed by these examples that grow on mud, a character that is not actually described in books, although the *stems* are said to root from the lower joints.

Holcus mollis L. Low hedge between Mangotsfield and Moor-end, and amid furze on a small part of Yate Common; both in West Gloucester. We had previously no modern station on that side of Bristol for the grass, which must either be very rare or has been overlooked in the vice-county. It flowered on until the end of September.

Festuca arundinacea Schreb. in West Gloucester. Several large tufts on a bank of shingle at New Passage: first noticed in September, 1908. It is unlikely that these had been established more than a year or two. Possibly they were derived from the Wye valley on the opposite side of the Severn, where the plant is abundant on banks of the tidal river at Tintern and the Wynd Cliff. Bank of the Avon just below Hanham. A critical species, or quasi-species, according to the individual view; but to us this is certainly a distinct plant, class it how you may. The following characters—of the Avonside gathering—carry it far from *F. elatior* as we understand it. Stems 5 ft. or more. Lower leaves 11 mm. broad. Lowest panicle-branches with more than ten spikelets. Spikelets 15 mm. long with about seven flowers, and the upper glumes equalling two-thirds of the contiguous flower.

Besides the above, we possess a long list of new plant localities of minor importance and little general interest.

FRANCIS BLACKWELL FORBES
(1839–1908).

THE notice of Francis Blackwell Forbes which appears in the recent issue (October, 1909) of the *Proceedings of the Linnean Society* does somewhat scant justice to his botanical attainments, containing as it does no reference to his papers published in this Journal, nor to his collections. It seems therefore worth while to supplement it by some particulars as to these and other points.

The best account of Forbes is that in Bretschneider's invaluable *History of European Researches in China* — a veritable treasure-house of information on all that concerns Chinese botany. From this we learn, on Forbes's own authority, that he went to China as an attaché of Mr. Reed, the American Plenipotentiary, arriving at Hong Kong in November, 1857, at which time he was about eighteen years of age, having been born, as shown by an entry in my autograph-book—now in the library of the National Herbarium — on August 11, 1839. He subsequently devoted himself with success to a business career and became the head of one of the largest commercial houses in China; at the same time he cultivated other interests, notably those of the local branch of the Royal Asiatic Society, in the permanent establishment of which in Shanghai, where he resided, he took a prominent part. His services as Swedish Consul-General in Shanghai were recognized by the bestowal of a Knight-Commandership of the Swedish Royal Order of Wasa.

In 1869 Forbes resolved to take up the study of plants, and wrote to Hance asking how he might best set about it. Hance replied in a letter of "fourteen closely-written pages, filled with most valuable hints as to books and methods of work." Thus began a correspondence which developed into friendship: "Although I never met him," says Forbes, in the memoir quoted,* "except in 1874 during a visit of two days at his house, we seemed in the course of years to draw very close together, and on my departure from China in 1882 he kindly wrote that he felt he was losing one of his most intimate friends." Hance wrote from time to time in terms of commendation of Forbes's work, and commemorated him in *Euonymus Forbesii* and other species. While with Hance Forbes made the acquaintance of Mr. Charles Ford, then Superintendent of the Hong Kong Garden, from whom as well as from Hance he received many specimens, which formed the foundation of his herbarium. He himself began to collect in 1872, being assisted by his wife, after whom *Adenophora Isabellæ* Hemsl. is named. In 1875, in which year he became a Fellow of the Linnean Society, Forbes brought his plants to the British Museum to be named, presenting in return for this service about three hundred specimens to the National Herbarium; another collection was named by Mr. Hemsley, who made it the subject of a paper in Journ. Bot. 1876, 205, 210. During his stay in Europe, Forbes visited the Paris Museum and Petersburg; at the latter place he made the acquaintance of Maximowicz, from whom he received specimens.

Forbes returned to China in 1877, and from that year until 1882 was resident at Shanghai, where he devoted his spare time to botanical pursuits. He abandoned his Chinese commercial career in 1881, and in 1882 settled in England, where he lived until 1886. During this period he was a frequent visitor to the

---

* Journ. Bot. 1887, 1–11, which incidentally contains much information as to Forbes's own work.

British Museum and Kew. Of a genial disposition and agreeable manners, he became a welcome visitor at the National Herbarium, where he established cordial relations with the then keeper (Mr. Carruthers) and with the writer of this notice. A committee of the Royal Society had been formed in 1884 to report on the Chinese Flora; on the motion of Mr. Carruthers, Forbes was invited to join this body, and placed at its disposal the material he had already accumulated. This, which was indeed the basis of the enumeration, included his extensive bibliography as well as a list of the specimens in the National Herbarium and Kew, compiled at his expense by Mr. Hemsley. The result was the production of the useful work, occupying three volumes (xxiii, xxvi and xxxvi) of the Linnean Society's *Journal*, which is conveniently known as the *Index Floræ Sinensis*. Although Forbes's name appears as joint author of the work with Mr. Hemsley, its execution must, as the notice in the *Proceedings* points out, be "wholly credited to Mr. Hemsley and his co-operators," for Forbes became again engaged in commercial pursuits. He, however, remained keenly interested in its progress, and was greatly annoyed by the apparently unreasonable delay which attended its completion—its production extended over nearly twenty years. On his last visit to the National Herbarium in July 1906 Forbes discussed with the staff the possibility of adding to the *Index* an enumeration of the Chinese ferns, but this led to no result.

It was on his way home from China in June, 1882, that Forbes visited Paris and inspected the packet of Pekin plants collected in 1740-1747 by the Jesuit missionary d'Incarville, which formed the subject of a paper by Franchet in Bull. Soc. Bot. France, xxix. (1882); an abstract of this paper, with notes of his own, forms Forbes's first contribution to this Journal (1883, 9–15).* In the same year (pp. 145–149) he published a paper "On *Cudrania triloba* and its uses in China," which shows him an apt pupil of Hance, whose contributions often contained valuable additions to our knowledge of the economic properties of the plants he described. In his paper on Chinese Oaks (Journ. Bot. 1884, 80–86) and his note on *Eugenia microphylla* (*op. cit.* 124) he rescues from oblivion species described in Abel's *Narrative* (1818) which had been overlooked by monographers; here he proposed the name *Quercus Bungeana*† for the tree which had been called *Q. chinensis* by Bunge—a name rendered invalid by Abel's earlier *chinensis*. The same volume contains an interesting paper "On the Botanical Terms for Pubescence"—a term which Forbes shows to be employed in very various senses by different botanists—and one on some critical Chinese species of *Clematis*. In 1885 he published, also in this Journal, to whose pages indeed his contributions seem to have been confined, a review of Franchet's

---

* It may be worth noting here that Petiver's "Herbarium nostrum Sinense pictum," which is mentioned in this paper as not having been traced, will be found in the Sloane Add. MSS. 5292–4.

† This name is retained in *Index Fl. Sinensis*, ii. 508, but it is not easy to see why, as *Q. acutissima* Carruthers, cited as a synonym, dates from 1861.

Plantæ Davidianæ—this, like the rest of his papers, showed a considerable acquaintance both with plants and literature, and gave promise of excellent work in the future. In 1886, however, financial pursuits claimed his attention, and in that year Forbes settled in Paris, where he became on intimate terms with Baillon; from this time his only contribution to botanical literature was the biography of Hance, already referred to, published in this Journal for 1887, and his botanical correspondence ceased. About 1904 Forbes left Paris for Boston, Mass., where he died in November, 1908.

During his residence abroad, Forbes's herbarium and MSS. were lodged in the Department of Botany, and were available for the use of the botanists engaged on the *Index Floræ Sinensis*. In December, 1904, when visiting the Department, he presented these to the National Herbarium; his collection contained about four thousand specimens, mostly of Chinese plants, among which were many from Pekin, given to him by Bretschneider (whose personal acquaintance Forbes made during a visit to that place in 1874) and others from Dr. J. R. Campbell, who married Forbes's eldest sister; from W. J. Clarke, who collected near Shanghai, and from W. R. Carles, with whom Forbes visited Che Kiang in 1881. Duplicates of his plants were presented by Forbes to Petersburg and to Kew; a list of the novelties collected by him is given by Bretschneider (*op. cit.* 724).

JAMES BRITTEN.

SHORT NOTES.

ORCHIS MACULATA var. O'KELLYI.—Under this name Mr. Druce describes (in the *Irish Naturalist* for October, 1909) a new variety from Ballyvaughan, co. Clare, which he names after its discoverer, Mr. P. B. O'Kelly, to whom it has been known for many years. The description is as follows:—

"Plant 9–14 inches high. Root-tubers two, each deeply divided into two spreading recurved fleshy parts. Leaves long, keeled, very narrow, not acute, spotted, pale green. Flowers in a dense oblong-cylindric blunt (not tapering) spike. Bracts shorter than the flowers, and inconspicuous. Flowers pure white, smaller than in *maculata*. Three segments of the labellum narrow, oblong, sub-acute; the middle segment longer and as broad as the lateral. Flowering in July. From *O. maculata* it differs by its unspotted and narrower leaves and pure white flowers, which are also slightly firmer in texture; by its oblong-cylindric blunt spike, and by the shape of the flowers. From the variety *præcox* of *O. maculata* (*O. ericetorum* Linton), it is still more removed by the above characters. Perhaps they are both soil varieties; one, with its narrower leaves and different-shaped spike, being limited to distinctly calcareous soils, with more complete drainage; the other, which flowers earlier, with its very broad labellum in which the middle division is smaller and shorter than the lateral, and with a peculiarly conical head, is the

plant of peaty situations; whereas the type prefers the trough of valleys on clay soils, although able like other hydrophytes to flourish on the impervious beds of the chalk hills. Rarely in the new variety there is a dot or two of colour near the base of the labellum."

FESTUCA MARITIMA L. IN KENT.—In Journ. Bot. 1903, 314, the discovery of the above plant was recorded. It was found by Rev. Adrian Woodruffe-Peacock at Carlby, in Lincolnshire, near the junction of the Cornbrash and the great Oolite Clay. Here, probably, it was alien. Its distribution is South European, including Spain and Portugal, and even France and Belgium; therefore it should be looked for on our southern and south-eastern coasts. In May last Mrs. Davy, of Copyhold, Sussex, an acute and clever botanist, sent me a *Festuca* from Littlestone-on-Sea, which I felt certain was this species; and Prof. Hackel has confirmed the name. The plant grew, Mrs. Davy tells me, with *Festuca rigida* and *Desmazeria loliacea* in dry sandy soil not far from the railway, but she was not inclined to think it owed its origin to the iron horse. Considerable planting has gone on in the neighbourhood, and it is possible it may have been introduced in that way. But its discovery here gives it a better claim to being a native species than the Lincolnshire record. Perhaps botanists will bear it in mind next spring and summer. Nyman puts it in a distinct genus—*Nardurus*—as *N. tenellus* Godr., although in facies it is something like weak *Festuca rigida*.—G. CLARIDGE DRUCE.

TILIA PLATYPHYLLOS Scop. IN BRECON.—I gathered this on Craig Cille, Brecon, in 1898, and showed Mr. Elwes it early this year, as he was a little sceptical about it being indigenous. On the cliffs of Cille it looked absolutely native, and there I think it seeds, but I was unable to reach a young plant in order to pull it up to prove that it was not a sucker-plant. In August it was fruiting freely, and, although not ripe, the fruits appeared well formed. This plant is recorded for the Principality—*i. e.* for Radnor—in Top. Bot., on Mr. Ley's authority.—G. CLARIDGE DRUCE.

DICRANUM BERGERI Bland. IN CAITHNESS.—I observed large fruiting cushions near the Dubh Lochaus on Killimster Moss, Caithness, June, 1908. A specimen was confirmed by Mr. H. N. Dixon; it is new to the north of Scotland. Mr. D. Lillie, of Watlin, reports the moss as fruiting at the same locality, May 12, 1909.—CECIL B. CRAMPTON.

REVIEWS.

Botany of To-day. By G. F. SCOTT ELLIOTT, M.A., &c. Pp. xv., 352. London: Seeley & Co. "1910." Price 5*s*. net.

THE botany of to-day, as here exhibited, differs entirely from that of yesterday and the day before. Here is to be found nothing

in the shape of florid or picturesque writing, garnished with such scraps of verse as usually have so fatal an attraction for those who deal with flowers. We have instead a sternly scientific treatment of plant life, which will demand close attention on the part of the reader desiring to assimilate the instruction generously provided for him.

The author's leading idea is to trace the history of plant-life from its first appearance on the earth (distinguished amongst the worlds by being pre-eminently "green"), through the various stages of development by which its actual condition has been attained. Starting with the lowest Algæ (bluish-green), Fungi, and Lichens, it is supposed that the course of evolution has been through Mosses and Ferns to flowering plants, which appeared first in an open flora, such as is found in desert or arctic regions, afterwards in a close flora of small shrubs, and then in woodlands of associated trees. Even at the present day, arguments in support of this supposition are furnished by the mode in which places effectively sterilised by lava or other destructive agents are gradually reoccupied by vegetable growths.

Beyond this sketch of developments, the life-history of plants is also fully dealt with, from the individual cell and its protoplasm, upon which everything is ultimately based, up to all the combinations of cells of which vegetable tissues are built up, and the manner in which, individually and collectively, they conduct themselves.

Mr. Scott Elliott begins with a full and frank acknowledgement that as to the root of the matter, "what [protoplasm] is, how it lives, dies and reproduces itself, we are still in a state of hopeless ignorance" (p. 17). He considers, however, that we are justified in coming to the conclusion that "this minute speck of living slime is alive; it does things of itself, and it certainly does them on purpose." In various instances it is pointed out how plants have endeavoured to adapt themselves to the conditions of their environment. Difficulties there are, of course, in plenty—here are one or two specimens.

Of *Anemone nemorosa* we are told (p. 26) that the various parts—stem, roots, leaves, blossom, and so on—"all contribute somehow to the general welfare of the Wood Anemone; that is, they form a co-operative association with a common end. Yet one can hardly believe that the root-cells, *e. g.*, are in the least degree aware even of the existence of the flower for which they work themselves to death." Indeed, far from this, "it might be possible to show that some of them are competing eagerly with one another. The leaves are ruthlessly sacrificed as soon as they are past work, and the flower begins to form. Bud scales, petals, and stamens are at once thrown off as soon as they have fulfilled their functions. The whole flowering-stalk is sacrificed as soon as the seed is scattered, and the fat, black, buried, and scarred stem remains for some six months at least compact, well guarded, and awaiting the reviving influence of the spring."

But, which seems to introduce a new and unexpected element

into the methods of natural selection, it would appear that some plants are content to devote their existence and sacrifice themselves for the benefit of others. Thus (p. 24), "Foxglove and Raspberry, which spring up in extraordinary profusion where a wood has been felled . . . are apt to vanish when the wood begins to reform itself. But they are of some use to it," for they cover the soil with rich layers of leaf-mould, and utilize all the sunshine during these years. "So also with the thorny thickets of sloe, blackthorn, and hawthorn, through which the young trees have to force their way up to the light. . . . Such a thicket would keep out roe and red deer and cattle, and so give more chance for the quick growth of ashes and birches and the slower and more sturdy development of young oak trees. So soon as the forest trees grow up and overshade the thorny rosaceous shrubs, these latter die away, but their life-work is *not* wasted. Everything that they have made, every particle of carbonic acid or of nitrate used by them is returned to the soil, and is used again by the higher form of vegetation."

It appears to be a main assumption throughout that trees are high in the botanic scale in proportion to the height to which they grow; for, "in this connection the higher plant is both the taller and the more complex. An oak or beech is of much more importance to the world than a hawthorn." This probably is true, from a business point of view, but are we to understand that from that of the evolutionist the *Rosaceæ*, even though bearing thorns, hold a position inferior to that of the *Amentaceæ*?

Turning to quite another matter, we all know how greatly distressed others besides Mr. Darwin have been by the cruelty exhibited by cats playing with mice, and ichneumon wasps planting their grubs in the bodies of caterpillars, but it is probable that few persons have raised a similar question as to plants. Our author, however, finds it necessary seriously to consider it in regard of their behaviour towards insect visitors (p. 150). In some instances, as that of certain Asclepiads, and notably *Araujia sericifera*, a native of Buenos Ayres, a charge of "senseless and useless cruelty" is held to be proved. But in most instances an excuse is forthcoming. "If in some cases insects be artfully doused in a liquid bath, while they are thus compelled to assist the pollination of the plant, they are probably not much the worse for its ducking; and if in others they are made drunk on honey, this is again all in the way of business, and no doubt in time they will discover how to enjoy it without injuring themselves, much as, according to Dr. Archdall Reid, intemperance will inevitably work out its own cure amongst human beings." It must, however, be confessed that the prospect of this happy consummation is not very exhilarating.

The illustrations are well done, though for the most part they have no obvious connection with the letterpress; and the book, which has a good index, is well-written and interesting.

J. G.

Prodromus Floræ Britannicæ. By FREDERIC N. WILLIAMS. Part 6. Pp. 259–362. October, 1909. Price 5*s.* 1*d.*, post free. 110, High Street, Brentford: C. Stutter.

WITH praiseworthy promptness the present part, after an interval only of five months since the previous one, is to hand. At this rate of progress there is reason to hope that a few years more will suffice for the completion of such a valuable addition to the knowledge of the British flora as this work affords.

After the conclusion of the *Asperifoliaceæ*, the families *Polemoniaceæ* (one species), *Convolvulaceæ* (5 species in 2 genera), *Verbascaceæ* (4 species in 1 genus), *Scrophulariaceæ* (54 species in 16 genera), *Gesneriaceæ* (13 species in 2 genera), and *Pinguiculaceæ* (8 species in 2 genera) are fully dealt with, as well as the greater part of the *Plantaginaceæ*. Altogether in this part 99 species, distributed among 28 genera, are comprehended, bringing up the totals already published to 372 species among 110 genera, and altogether occupying 362 octavo pages.

In the introductory note a computation is made that, from the statistics obtainable from the first six parts, it may be expected that the whole Flora will extend to about 1420 pages. It thus seems that rather more than a quarter of the entire work is now done. "In the present part, the species included in critical genera are treated somewhat more fully than in the case of those of genera less subject to polymorphic variation. At the same time the compiler has made some attempt to compare the plants of Central Europe and of Scandinavia with those of this country, and to bring the British List into line with the more progressive Continental Floras."

British botanists cannot but feel grateful for the numerous particulars relating even to minor or fugitive characters which are found in these pages. Ordinary and less painstaking students would have welcomed the inclusion of artificial keys to the genera and species, had it been practicable and within the scope of the work to have supplied such a ready aid, at least for the larger families and more critical genera and species.

Due attention, as in the previous parts, has been given to the discrimination of the numerous varieties and forms observable among the British species. A useful feature also consists generally in the addition of the date to the names, synonyms, and other references quoted. In this way a clearer idea of historical arrangement and chronological order is obtained than would be obvious without this help. It is especially valuable in the cases where the title-page of the book referred to gives a range of years or is otherwise ambiguous. For instance, L. Reichenbach's *Flora Germanica Excursoria* bears on its title the date "1830–1832," and no greater precision is supplied in Pritzel's *Thesaurus*. Mr. Williams, however, in the course of this part quotes pp. 357 and 379 of Reichenbach's book as of 1831, though apparently by inadvertence he quotes page 319 as of 1832.

The careful treatment and descriptions as to special points, in

connection with species, are fairly illustrated in the case of *Lithospermum purpureo-cæruleum* L. The description is drawn up from the fine series of specimens in the National Herbarium in Cromwell Road; and Mr. J. W. White's important paper in this Journal for 1884, pp. 74–76, is made use of. "In English botanical manuals the chief feature in the development and propagation of the plant has been overlooked. None of them correctly describe the manner in which it *strides* over the ground by means of the peculiar arching elongation of the barren shoots, which ultimately produce new individuals by rooting at their tips. . . . The roots do not creep; and the barren shoots, which seldom spring from a flowering-stem, are primarily erect, then high arching, and ultimately root at the tip, often at a considerable distance from the parent; the young plants quickly becoming separated by the decay of the connecting links." The British distribution of the species in the only four counties where it now occurs, namely, Devon, Somerset, Glamorgan, and Denbigh, is set out in full detail, with citation of the specimens seen.

The indigenous nature of the distribution of species is scrupulously attended to; for instance, *Polemonium cæruleum* L. is stated to be "clearly native in the limestone tracts of the north of England, where it ascends to 300 metres on the scar limestones of W. Yorkshire (*F. A. Lees*). Apparently indigenous there in copses and along the sides of streams, doubtfully elsewhere. An escape in Scotland and Ireland, and alien in many reported stations." Localities are cited for the counties of Stafford, Derby, York, Northumberland, and Westmoreland. In the spelling of the trivial name, Mr. Williams prints *cæruleum*, though it seems unnecessary to vary the Linnean form of the word *cæruleum*.

Of Dodder only two British species are admitted, namely, *Cuscuta epithymum* Murr. and *C. europæa* L.

The Mulleins (*Verbascum*), in accordance with the views of several systematists, are kept separate from the Figwort family and placed in a family called *Verbascaceæ*. Four species only are admitted, namely, *V. Thapsus* L., *V. Lychnitis* L., *V. pulverulentum* Vill., and *V. nigrum* L. With regard to the other two species which are usually given in British floras there is a note added: "*V. blattaria* and *V. virgatum*, in most of their reported stations, being evidently escapes from cultivation, are not here included in the British list." It is also remarked: "As on the Continent, the British species of *Verbascum* hybridize freely, and specific distinctions are not well-marked."

The *Scrophulariaceæ*, as restricted above, occupy the bulk of this part, that is, nearly 57 pages; the 54 species are distributed among 16 genera. The first genus involves a novelty in the system usually adopted in British books; but its employment is amply justified. Unfortunately the plan of Mr. Williams's work does not supply descriptions of the genera adopted, but only the name with half a dozen references is given; but in this case at all events it would have been convenient to have given at least a

diagnosis. The genus referred to is *Kickxia* Dumort. Fl. Belgica, p. 35 (1827), which was named in honour of Joh. Kickx, a former professor at Ghent; it was designed to contain two species, namely, *Antirrhinum Elatine* L. and *A. spurium* L., which are familiarly known to British botanists under the names of *Linaria Elatina* Mill. and *L. spuria* Mill. respectively. They are distinguished by their capsules dehiscing with circumscissile lids and not by vertical valves with apical teeth; they also have axillary flowers not arranged in terminal racemes or spikes, as in the rest of *Linaria*, with the exception of *L. Cymbalaria* Mill.

Antirrhinum minus L., now often called *Linaria minor* Desf., is, in accordance with the views of Willkomm and Lange, referred to the genus *Chænarrhinum* Reichenb. and called *Ch. minus* Willk. & Lange. The original spelling of the word was *Chænorhinum*, which De Candolle, Fl. Fr. v. 410 (1815), designated for a group of seven species of the genus *Linaria*, including *L. minor* Desf.; at the same time he said that he did not doubt that a complete examination would furnish characters sufficient for a distinct genus.

For the genus usually written *Scrophularia* Mr. Williams adopts the form of spelling '*Scrofularia*'; in justification he quotes the note of Pfeiffer, *Nomenclator botanicus*, vol. ii., pars altera (1874), 1117, "Rectius *Scrofularia*, a radice scrofulis sanandis usitata (Etymologia graeca non innotuit)." Similarly he writes the name of the family "*Scrofulariaceæ*."

Sibthorpia europæa L., both as to the genus and the species, is treated with much attention. The distribution of the plant within the limits of the flora is given in detail for the counties of its occurrence, namely, Cornwall, Devon, Sussex, Glamorgan, Caermarthen, and Kerry, as well as for the Channel Islands. In South Devon it is stated, on the authority of Archer Briggs, to ascend to 90 meters; and in Kerry, according to H. C. Hart, to be found from the sea-level up to 510 m. It may be mentioned that in North Devon the species ranges between 30 and 180 m. alt. The genus was named by Linnæus in 1751 in honour of Dr. Humphrey Sibthorp, who occupied the botanical chair at Oxford from 1747 to 1784, and on his retirement went to reside at Fullingcott, an old manor house in the parish of Instow, N. Devon, where he died, August 17, 1797. There is a mural tablet to his memory in Instow church. Polwhele (*Hist. Devonsh.* 91 (1797)), writes:—"Linnæus, suspecting that the English had erroneously multiplied the species, doubted the existence of this plant, till Dr. Sibthorp, of Oxford, convinced him of its reality, by sending him a specimen of it in 1750. For this valuable present, Linnæus thus expresses his thanks in a letter to Dr. Sibthorp, dated Upsal, July 15, 1750: 'Pro alsine spuria tibi immensas grates habeo—quia eandem pro planta ficta ex hydrocotyle habuissem, nisi ipse vidissem et palpitassem pulchrum specimen quod in tui memoriam servabo.' Accordingly Linnæus names the plant, in memory of the donor, *Sibthorpia* . . . The *Sibthorpia europæa* seems to have for its parents the golden saxifrage and marsh pennywort."

Of *Digitalis purpurea* L., Mr. Williams writes: "Never found on limestone. Where hills of limestone and gritstone dip into each other, the absence or presence of this plant is an infallible index to the character of the immediate substratum." It has been long ago stated that the foxglove is entirely absent from the county of Cambridge: see Babington, *Fl. Cambs.* 317 (1860); and W. West, in *Journ. Bot.* 1898, 246.

The genus *Euphrasia* occupies nearly seventeen pages; nine species are recognised and described, a number which is midway between the original single species, *E. officinalis* L., formerly given in British floras, and the seventeen (sub-) species that have been during recent years suggested as occurring in Great Britain and Ireland.

The genus *Odontites* Hall. has two species assigned to it, namely, *O. rubra* Gilib. and *O. littoralis* Nyman; the latter is distinguished from the former by its simple stem, ovate-lanceolate leaves, broadly lanceolate and obtuse calyx-segments, and exserted capsules. The references given in the *Index Kewensis* and by all other authors are said to be incorrect.

The plant called in most British floras *Rhinanthus Crista-galli* L. is referred to the genus *Alectorolophus* Hall. Three species are given, with full descriptions, namely, *A. glaber* All., A. *groenlandicus* Ostenfeld, and *A. hirsutus* All. "This account of the British forms under *Alectorolophus* has been gone into in some detail, as not only has a good deal of material been examined, but the arrangement is different from that current in recent British floras and plant-lists, and deviates in many points from the lines laid down in Sterneck's monograph of the genus." Mr. Williams gives at some length the reasons for his adoption of the name; these will be considered in a separate note.

The genera *Orobanche* Tourn. and *Lathræa* L. Mr. Williams places in the family *Gesneriaceæ*, adding the remark: "I follow Eichler, Goebel, Warming, and Pfitzer (1902), in regarding the Orobancheæ as a degenerate group of Gesneriaceæ (by parasitism) rather than as a distinct family." The species *O. ramosa* L. is mentioned, it having been long ago reported as occurring in the eastern counties; but he says that it cannot in any case be considered a British plant, and it has no place in the list. Another species, *O. arenaria* Borkh., though described in several British floras, is also mentioned, but is not considered worthy of a place in the British list. The species of broomrape which are fully admitted are—*O. purpurea* Jacq., *O. vulgaris* Poiret (= *O. caryophyllea* of some authors), *O. major* L. (= *O. elatior* Sutton), *O. rapum-genistæ* Thuill. (= *O. major* of some authors), *O. alba* Stephen (= *O. rubra* Sm.), *O. reticulata* Wallr., *O. amethystea* Thuill., *O. picridis* F. W. Schultz, *O. barbata* Poiret (= *O. minor* Sm.), and *O. hederæ* Vaucher.

In his prefatory note on the wrapper of this part Mr. Williams implicitly justifies his ignoring of the Vienna recommendation of the use of capital initials for old generic names, to which attention was called in a former notice (Journ. Bot. 1909, 230), by the remark:

"In accordance with the use in all recent Continental Floras (*e.g.*, Schinz & Keller's *Fl. d. Schweiz*), specific names derived from genera are always written with a small initial." A reference to the recent instalments of Rouy and Foucaud's *Flore de France* (July, 1909), Janchen's *Flora der Dinarischen Alpen* (1908), Koch's *Synopsis* (1907) and other works does not support Mr. Williams's *obiter dictum*. Nor does the *Flora* which he specifies—at any rate, in the last edition (1909); the Vienna recommendation would appear on the contrary to be generally observed.

W. P. H.

Fungi and how to Know Them; an Introduction to Field Mycology. By E. W. Swanton. With 16 coloured and 32 black and white plates by M. K. Spittal. London: Methuen. Pp. 210. Price 6s. net.

Fungi have been in the past undoubtedly the most neglected section of the vegetable kingdom. In our country, there have never been wanting enthusiastic mycologists who have kept alive the study in the field, but no one has popularized the subject so as to clear away the mass of technical terms that have obscured it. The amateur botanist has been repelled by the preliminary difficulties and checked by the want of the simpler kind of book that would initiate him into the mysteries of the science. As regards the higher plants, he has been helped by books suited to every varying capacity, but in Fungi, if we except Mr. Worthington G. Smith's *Guide to the Sowerby Models*, little has been done for the encouragement of beginners.

There are several reasons for this neglect. The transitory nature of these growths prevents continuous and repeated observation; they are here to-day and gone to-morrow, some other equally unknown fungi having taken their place. The existence of each particular toadstool is of insufficient duration to allow easy familiarity or definite knowledge of its form and colour or of any peculiarities of its growth to be acquired. Another deterring cause is the extent and variety of the subject, and the text-books have increased the difficulty by providing much letterpress and little illustration.

Mr. E. W. Swanton's book will go far to remove this reproach. He has avoided technical terms, has discriminated in his selection of fungi, choosing always the more common species for description, and has supplied the student with a wealth of illustrations in colour as well as in black and white. The contents of his book fall naturally into two divisions. In the first, there is a general discussion concerning fungi, touching on all points connected with their growth and development, explaining their complicated life-histories and their place in the economy of nature, the importance of which is being recognized more and more. Advice is given to collectors how and where to look for fungi, how to examine them, and how best to preserve them. The part ends with a bibliography and a glossary which seem curiously misplaced in

the middle of a volume instead of at the end where we are accustomed to find such aids.

The second part is wholly systematic, and the student is helped each step of the way by carefully drawn-up synoptic tables. Only a few species are described in each genus, but these are, in nearly every case, the most familiar examples, and such as are most likely to be met with by beginners. The need for more advanced books will doubtless make itself very quickly felt, but a good foundation is laid in the volume before us.

A short section is devoted to the Ascomycetes, a large and important group but many of them microscopically small. But the author's aim has been to deal with the larger fungi, so only a few of the more conspicuous forms of this group have been described and figured. A special note of commendation is due to the attempt made to render the names of the plants intelligible by giving their derivations. Indeed, no pains have been spared to make the subject not only intelligible but attractive, and Mr. Swanton is to be congratulated on the success of his undertaking.

A. L. S.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on December 2nd, 1909, Mr. Clement Reid exhibited on the screen photographs of fruits and seeds of some of the plants introduced by the Romans into Britain. The remains have been collected principally from disused Roman wells, employed subsequently as rubbish-pits, and often sealed up under Roman pavements of later date. The principal sources have been Roman Silchester, Caerwent, London, and Pevensey, and to a large extent the collections have been made by Mr. A. H. Lyell, who has been most careful to reject any deposit of doubtful or later date. The fruits and seeds exhibited belong to pea, bean, fig, grape, mulberry, medlar (a very small variety), apple, cherries (probably both black and red), sloe, bullace (wild and cultivated), damson, a larger plum like the "black plum" of Cornwall, Portugal laurel, black and white mustard, turnip ? fennel, dill, coriander, alexanders, *Chærophyllum aureum* (a casual, perhaps introduced with packing-case rubbish from France, and not grown in Britain), belladonna, henbane, field poppies (*Papaver Rhœas*, *P. Argemone*), the opium poppy (seeds of this were probably used, as in Rome, scattered on loaves of bread), greater celandine, corn-cockle, white campion, bladder campion, penny cress, sow-thistle, ox-eye daisy, *Chenopodium urbicum* and *C. murale*, and leaves of box. Box-leaves have been found in three different rubbish-pits in Roman Silchester; the branches may have been used for wreaths, as the nearest native substitute for the Italian myrtle. The plants thus far found do not suggest any direct shipping trade with the Mediterranean. The peach, apricot, almond, and other fruits that will only ripen

south of Britain are missing. The fruits and spices found are only such as can be grown commercially in Britain at the present day, and this makes it probable that the abundant fig and grape seeds belong to fruit grown in this country and not imported in a dried state. Mulberries do not travel well and are scarcely ever dried; they must have been grown at Silchester.

A NEW and enlarged edition was published last year of Mr. A. H. Johnson's work on *The Cultivation and Preparation of Para Rubber* (Crosby Lockwood & Co.), the previous edition of which was noticed on p. 39 of this Journal for 1905. The methods of cultivation and preparation for the market of *Hevea brasiliensis* are still being evolved and improved, and no one with experience of its planting will contend that the present methods can be looked upon as final or perfect. Mr. Johnson's book is a careful compilation of the observations and experiments carried on in the East Indies, but it is to be regretted that the statistics which form a considerable part of the volume should be out of date or obsolete. Thus the acreage for the Malay Peninsula is given as 150,000, when the official report for 1907 published early in 1908 shows that the acreage was then sixty per cent. greater, *i.e.* 241,000. The work will be of use to those considering the question of embarking in the rubber industry, but the estimates given as to the cost of opening and maintaining land in the East are misleading, as they are some years old and the figures as to rent and other charges are inaccurate, the rents per acre in Mr. Arden's estimate for the Malay States being now four times the amount given there. The book is intended for the planter or the investor, and the scientific portion of the book does not bulk largely, but there is information of an interesting character in relation to the relative growth of the *Hevea* in the Indo-Malayan region, in Africa, and in the South Sea Islands.—J. B. C.

MR. QUARITCH has published in a very handsome folio volume (price one guinea net) forty-one views of *Warley Garden in Spring and Summer*, by Miss Ellen Willmott, of Warley Place, whose name is perhaps more familiar to horticulturists than to botanists, although the latter are indebted to her for a number of rare and interesting plants which she has been the first to introduce to cultivation. The pictures, beautiful in themselves, are admirably reproduced, and by their size give a better idea of the scenes they depict and of the plants they represent than is usual in books containing views of gardens. There is no text beyond the dedication—"To My Sister"—and table of contents, but the illustrations need no explanation.

THE vacancy in the Department of Botany, British Museum, caused by the retirement of Mr. Britten, has been filled by the appointment of Mr. Herbert P. Wenham. Mr. Wenham, who has been in the service of the General Post Office since 1903, left Trinity College, Cambridge, in 1900, and graduated B.Sc. of London in 1908.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of July Number.—Recent Advances in the Study of Heredity. Lecture III.—The Mendelian Hypothesis, by A. D. DARBISHIRE. On a Cone of *Calamostachys Binneyana* (Carruthers) attached to a Leafy Shoot (Plate I. and Text-figs. 31, 32), by HAMSHAW THOMAS. The Development of the Spores of *Equisetum*, by RUDOLF BEER. Review: Dr. Paul Bertrand on the *Zygopterideæ*, by D. H. S.

Subscription-Price, 15*s*. *per annum* (*ten numbers*) *post free*.
Price of single number, 2*s*. *Price of double number*, 4*s*.

Published Monthly by the Editor, The Botany School, Cambridge.

NOW READY.

PP. 32, WITH 2 PLATES, IN PAPER COVER. PRICE 2S., POSTAGE 1D.

THE BRITISH PANSIES.

BY E. DRABBLE, D.Sc., F.L.S.

PP. 24, IN PAPER COVER, PRICE 1S., POSTAGE 1D.

LINNÆUS'S FLORA ANGLICA.

DEMY 8VO, 44 PP., PRICE 1S., POSTAGE 1D.

INDEX ABECEDARIUS,

AN ALPHABETICAL INDEX TO THE FIRST EDITION OF THE 'SPECIES PLANTARUM' OF LINNÆUS.

COMPILED BY WILLIAM PHILIP HIERN, F.R.S.

LIMP CLOTH, 8VO. PP. 276. PRICE 6S. NET. POSTAGE 3D.

NOTES ON THE

Drawings for Sowerby's 'English Botany.'

BY F. N. A. GARRY.

DEMY 8VO, 23 PP., PRICE 1S., POSTAGE 1D.

INTERNATIONAL RULES FOR BOTANICAL NOMENCLATURE

ADOPTED BY THE INTERNATIONAL BOTANICAL CONGRESS HELD AT VIENNA. 1905.

London: WEST, NEWMAN & CO., 54, Hatton Garden, E.C.

SPECIAL OFFER TO BOTANISTS.

PRESERVE your Rare Plants and Flowers in a safe, methodical manner with our

BOTANICAL ALBUM.

Made of strong cartridge paper interleaved with printed schedules on transparent paper for recording the special features of each plant. Size 12¾ in. × 11¼ in. **Bound in cloth, only 2/6, post free 2/11.** Every Botanist will appreciate this album as forming an interesting souvenir of their pleasant rambles. Order it to-day. *Only a limited number at this very low price.*

ONLY 2/6, WORTH 5/-

W. & A. K. JOHNSTON, Ltd. (Dept. B), Edina Works, Edinburgh.

Journal of Botany Reprints.

BOUND SEPARATELY IN PAPER COVER. PRICE 1S. 6D. POSTAGE 1D.

THIRD SUPPLEMENT

TO THE

BIOGRAPHICAL INDEX OF BRITISH & IRISH BOTANISTS.

254 PP., DEMY 8VO, CLOTH EXTRA, PRICE 9S. 6D. NET.

BIOGRAPHICAL INDEX

OF

DECEASED BRITISH & IRISH BOTANISTS.

BY

JAMES BRITTEN, K.S.G., F.L.S., & G. S. BOULGER, F.L.S.

BOUND UP TOGETHER WITH

FIRST (1893–97) & SECOND (1898–1902) SUPPLEMENTS.

The SUPPLEMENTS can also be had separately, price 1/6 each; postage 1d.

DEMY 8VO, PRICE 1S. 6D.

Key to Genera & Species of British Mosses

BY THE REV. H. G. JAMESON, M.A.

PRICE 2S. 6D., POSTAGE 2D.

The Subsection Eu-caninæ of the Genus Rosa

BY MAJOR A. H. WOLLEY-DOD.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

Subscriptions to the Journal of Botany (16s. post free) for 1910 should now be sent to West, Newman & Co.

No. 566 FEBRUARY, 1910 Vol. XLVIII

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

British Oaks. By C. E. Moss, D.Sc. (Plate 502) (concluded) 33

Notes on the Flora of Flintshire. By A. A. Dallman, F.C.S. .. 40

The Name *Alectorolophus*. By W. P. Hiern, F.R.S. 53

Short Notes.—*Zannichellia gibberosa* Reichb. as a British Plant—Plants of North Devon—Cornish Plants—Abnormal *Carex*—*Ulota phyllantha* Brid. in Fruit—The late J. H. Davies—Lincolnshire Plants—New Records in Scottish Bryophyta—*Fumaria occidentalis*—Botanical Exchange Clubs 55

PAGE

Reviews:—

Flora descriptiva é illustrada de Galicia. Por el R. P. Baltasar Merino, S.J. 59

Hayward's Botanist's Pocket-Book. By G. Claridge Druce, M.A., F.L.S. 61

Bref och skrifvelser af och till Carl von Linné, med understöd af Svenska Staten, utgifna af Upsala Universitet 63

Book-Notes, News, &c. 64

Supplement.—The British Roses (excluding *Eu-caninæ*). By Major A. H. Wolley-Dod (continued).

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had price 1s. 6d. each.

AUTHORS' SEPARATE COPIES.—**Contributors are presented with six copies of their papers** as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

2 pages	25 copies	4s.	4 pages	25 copies	5s.	8 pages	25 copies	8s. 0d.
,,	50 ,,	5s.	,,	50 ,,	6s.	,,	50 ,,	9s. 0d.
,,	100 ,,	7s.	,,	100 ,,	8s.	,,	100 ,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

BRITISH OAKS.

By C. E. Moss, D.Sc.

(Plate 502.)

(Concluded from p. 8.)

Q. Robur would appear to be the only Oak stocked by British nurserymen; and Mr. A. C. Forbes (Gard. Chron. 1900, ii. 295) states that it is difficult to obtain seeds from them of *Q. sessiliflora*. This is curious; for, as has been shown, this Oak is very abundant in certain localities, and in some seasons produces ripe acorns in abundance. The Oak found in British plantations is, in my experience, invariably *Q. Robur*; and this is the case even in localities which, on account of the shallow soil, are most unsuited for its growth. Sir H. Maxwell (*op. cit.*, 342) refers to "the incalculable harm wrought of late years in Scottish woodlands by planting the Pedunculate instead of the Sessile Oak." Similarly, on the shallow soils of the Millstone Grit and Coal-measures of the Pennines, *Q. Robur* is occasionally planted, but it is not a success there. The folly of planting *Q. Robur* at Chatsworth, Derbyshire, has also been commented on (*op. cit.*, 218, where, however, the geological formation is erroneously stated to be the Carboniferous Limestone instead of the Millstone Grit). Whilst Oaks are native and locally abundant on the Carboniferous Limestone in certain parts of England, this is not the case in north Derbyshire. In the woods of the valley and the tributary valleys of the Wye, for example, there are not half a dozen Oaks, and even these appear to be planted specimens. This is all the more remarkable, as many attempts have been and are still being made to introduce the tree into the plantations of this particular locality. On the Carboniferous Limestone of the Craven District of Yorkshire, also, Oaks are very rare, whilst the Ash is abundant in the natural woods and scrubs.

Q. Robur as a native tree in Britain ascends to about 880 ft. (268 m.) in southern England, *e.g.*, in west Kent. In east Cheshire, the natural *Q. Robur* region ceases at about 600 ft. (183 m.): in west Yorkshire, it does not attain even to this comparatively low altitude. In plantations on the Pennines, the tree occurs so high as 1100 ft. (335 m.); but it is not successful there, where, however, *Q. sessiliflora* is indigenous. At altitudes above 1000 ft. (302 m.) on the Pennines, the only successful non-indigenous deciduous trees are *Acer Pseudo-platanus* and *Fagus sylvatica*, both of which are cultivated up to about 1600 ft. (488 m.).

It has been stated that *Q. sessiliflora* is characteristic of dry and *Q. Robur* of wet soils; but my observations do not confirm this. *Q. Robur* is dominant in woods which have a soil so wet as to support extensive stretches of moisture-loving plants like *Carex pendula*, *Lychnis Flos-cuculi*, *Spiræa Ulmaria*, and *Epilobium hirsutum*; whilst other woods dominated by *Q. Robur* possess ground species so characteristic of dry soils as *Pteris aquilina*,

Holcus mollis, *Carex pilulifera*, and *Rumex Acetosella*. Similarly, some woods dominated by *Q. sessiliflora* are so wet as to permit the great abundance of *Equisetum sylvaticum*, *Viola palustris*, *Sphagnum* spp., and *Polytrichum commune*; whilst other woods dominated by this species of Oak are dry enough to allow of extensive sheets of *Pteris*, *Agrostis vulgaris*, *Aira flexuosa*, and *Galium saxatile*.

The grounds on which *Q. Robur* and *Q. sessiliflora* are regarded as distinct species may be summarized here. In its reflexed leaf-auricles *Q. Robur* possesses a positive character which is almost unique in the genus. In its absence of multiple hairs *Q. Robur* is also exceptional, as such hairs are present in the great majority of Oaks. These and other characters are constant, and come true from seed. Lastly, the habitats of *Q. Robur* and of *Q. sessiliflora* are very different, and in many districts mutually exclusive. It therefore seems unreasonable to unite the two plants under one specific name.

III. Quercus Robur × sessiliflora (see Plate 502).

Whilst several of the earlier writers on British Oaks had not overlooked the possibility of the occurrence of hybrids in this country, none had any positive evidence to offer, and most decided against the probability of their occurrence. Recently Mr. Henry (1907) has stated that hybrids of Oaks "seem to be rare in the wild state in England"; and Mr. Druce, as already stated, puts the hybrid in his list. Neither Mr. Henry nor Mr. Druce, however, gives a definite record, and thus the first record seems to be that in *The Naturalist* for March, 1909 (p. 113). The hybrid Oak has recently been observed in the following Watsonian vice-counties:—East Cornwall (A. G. Tansley), South Hants (W. M. Rankin!), East Kent, West Kent, East Norfolk, Cambridge, Bedford, Hereford (A. G. T.!), Worcester (A. G. T.!), Chester, South Lancaster, West Lancaster, North-east Yorkshire (W. G. Smith!), South-west Yorkshire, Mid-west Yorkshire (W. M. R.!), and Westmoreland. Herbarium specimens indicate its occurrence also in Brecon and West Perth (Herb. Mus. Brit!), Dumbarton (Herb. Kew!), Sussex and Derbyshire (Herb. Druce!). There can be no doubt that the hybrid will be found in several additional districts, wherever, in fact, a *Q. Robur* region adjoins a *Q. sessiliflora* region, and wherever both species grow in natural or semi-natural woods, as occasionally happens on deep, dry soils.

In the *Plantæ Europeæ* of Richter & Gürke (ii. 58, 1897) the hybrid is recorded from France, Germany, Tyrol, Austria, Hungary, Transylvania, Croatia, Slavonia, and Russia.

It seems probable that the described hairy varieties and closely allied species of *Q. Robur* may prove to be hybrids of *Q. Robur* with allied hairy species, such as *Q. sessiliflora* and *Q. lanuginosa*.

The plant is named *Q. intermedia* Boenn. *non* D. Don by Mr. Henry and Mr. Druce: the hybrid certainly appears to be Boenninghausen's plant; but this name, judging from the synonymy given by Gürke (*l.c.*) as follows, does not appear to be the earliest:—

Q. rosacea Bechst. in Sylvan. 67 (1813).
Q. hybrida Bechst. in Sylvan. 63 (1816), *non* Brot.
Q. intermedia Boenn. in Reichenb. Fl. Germ. Exc. 177 (1830).
Q. brevipes Heuff. in Wachtel Zeitschr. i. 99 (1850).
Q. pedunculata var. *pseudo-sessilis* Schur. in Oesterr. Bot. Zeitschr. vii. 9 (1857).
Q. pseudo-sessilis Schur. Enum. Pl. Transilv. 608 (1866).
Q. hungarica Kit. in Linnæa, xxxii. 353 (1863), *non* Hubeny.
Q. Csatoi Borb. in Mag. Növ. Lap. x. 133 (1886).
Q. erioneura Borb. in Deutsch. Bot. Monatschr. v. 164 (1887).
Q. superlata Borb. *l. c.*

Focke (1881) gives an additional name—*Q. ambigua* Kit.; but Gürke refers this to *Q. Robur* × *lanuginosa*.

The hybrid is easily distinguished by the presence of both multiple hairs (Plate 502) and reflexed auricles (Plate 502) on the under surface of the leaf. Both the petioles and the peduncles are long. Some of the larger veins run to the bases of the sinuses, but the general appearance of the lobing and venation is that of *Q. sessiliflora*. As stated by Focke (1881), its pollen is normal and its seeds fertile. Ripe seeds from hybrid trees germinate freely and well, and this indeed applies to *Quercus* hybrids in general. Sufficient specimens have not been critically examined to permit a full account of its variations being given, but the occurrence of marked forms or varieties in its putative parents obviously suggests that the hybrid also will prove to be a variable plant. Add to this the great probability that its characters will segregate independently, as in well-established cases of di-hybridism, and the difficulty of referring certain critical specimens of Oaks to one of the three preceding forms will be manifest. Judging from recent and careful work on plant-breeding, there seems every probability that the reciprocal parental crosses will possess identical characters. As in the case of many other natural hybrids, it is probable that the Hybrid Oak is not only self-fertile and capable of successful cross-pollination by other hybrids like itself, but also of being fertilized by the pollen of either parent. Thus arise forms which, owing to the independent segregation of the diagnostic characters of the parents, are difficult and perhaps impossible to determine.*

The distribution of this tree is in accord with its presumed hybrid origin. From Europe, it is only recorded from countries in which both *Q. Robur* and *Q. sessiliflora* are known to occur: in Britain it has only been observed in those localities where both occur in close propinquity. It has been found in every such British district which has been carefully searched; whilst careful observation in those woods where only one or other species occurs has failed to reveal it. It is interesting to add that it was the discovery of the Hybrid Oak in a wood in the west of Cambridge-

* Interesting accounts of recent work on plant-breeding, from the point of view here indicated, will be found in Punnett's *Mendelism*, and in Lock's *Variation, Heredity, and Evolution* (2nd ed.).

shire that led to the finding, in the same wood, of numerous plants of both *Q. Robur* and *Q. sessiliflora*, which latter species had not previously been recorded for this county. It is certain that the hitherto unsuspected occurrence, the widespread distribution, and the local abundance of the Hybrid Oak in Britain has been responsible for some of the confusion which botanists and foresters have manifested in the past with regard to the distinctness of the two native species.

Q. Robur and *Q. sessiliflora* have been said to flower at slightly different times, thus rendering the occurrence of hybrids highly improbable. Judging from observations made in the spring of last year on plants in the Botanic Gardens at Cambridge, it would appear that this is not invariably the case. On May 9th the stigmas of both *Q. Robur* and *Q. sessiliflora* were ripe, but the anthers had not burst. On May 10th (although the night had been frosty) many anthers of the latter species, but only a few of those of the former, had burst. *Q. lanuginosa* was more backward, and *Q. Cerris* still more so. The opening of the stamens of *Q. sessiliflora* and *Q. Robur* continued simultaneously for a fortnight, being delayed by cold weather. Many stamens of both species were killed by the cold; but the stigmas appeared to suffer very little.

What importance the Hybrid Oak may have as regards arboriculture and sylviculture remains, of course, to be proved; but, as hybrids of this and other genera of trees are said by Focke (*op. cit.*) and others to be more valuable from some points of view than the parent forms, it may be worth while for foresters to make careful observations and experiments with regard to the cultivation of the natural and fertile Hybrid Oak which occurs in some of the woodlands of this country.

IV. Quercus lanuginosa.

Quercus lanuginosa Thuiller, Fl. Env. Paris, ed. 2, 502 (1799).
Q. pubescens Willd. Sp. Pl. iv. 450 (1805).
Q. Robur subsp. *sessiliflora* var. *lanuginosa* DC. Prodr. xvi. 2, 10 (1864).

This plant, which is characteristic of certain districts, chiefly limestone ones, in south and south-central Europe, has been recorded by a few authors, though probably erroneously, as occurring in England. These have perhaps been misled by the erroneous reference by Hull and others of Smith's var. *β* of *Q. sessiliflora* to *Q. pubescens* Willd. (= *Q. lanuginosa*); and it is possible, too, that some of the forms of *Q. sessiliflora* with very hairy leaves have been responsible for some of the records. As, however, there is just a possibility that the true plant, in one of its less hairy forms, occurs in the south of England, it is well to give its more important characters.

Q. lanuginosa differs from *Q. sessiliflora*, to which it is closely related, in possessing young twigs and petioles which are densely hairy. The hairs on the under side of the leaf are also longer, more numerous, and much more conspicuous than in most forms of *Q. sessiliflora*. The bud-scales are pubescent all over the general

outer surface. The leaf-petioles are very long; and the lobes of the leaf, in some forms, are so much out of general leaf-plane as to give the leaf a very wavy margin. The fruit is usually sessile or subsessile; but, as in *Q. sessiliflora*, peduncled forms occur.

The tree is not cultivated for timber; and in England, even in the south, it is very rare as a planted tree in parklands. There is a specimen from Norfolk in Smith's herbarium, but whether or not from a planted tree is not stated. The plant is said to hybridize with both *Q. sessiliflora* and *Q. Robur*.

V. Quercus Cerris.

Quercus Cerris L. Sp. Pl. 997 (1753).

Q. echinata Salisb. Prodr. 393 (1796).

The Turkey Oak, native in Central and South Europe and in the Orient, is frequently planted in this country, usually as an ornamental tree in parklands, but occasionally in woods. Rarely, as in the west of Cambridgeshire, it produces ripe seeds, and seedlings spring up spontaneously in great abundance. It is, therefore, from the standpoint of the British Flora, to be regarded as a naturalized alien. Such plants are loosely termed "denizens" by many writers of county and local floras; but Watson, who defined the standard terms used to designate the rank or citizenship of British plants, reserved the term "denizen" for a species which, whilst "maintaining its habitats as a native species, without the direct aid of man," is only "liable to some suspicion of having been originally introduced by human agency." On the other hand, a species which is "certainly or very probably of foreign origin," whether established or not, he termed an "alien" (Watson, 1868). It is clear, then, that the Turkey Oak should be termed an alien and not a denizen, in the Watsonian sense; and, as it springs up spontaneously from self-sown seed, it is a naturalized alien. As it may be met with in all stages of development in semi-natural woodlands, a short statement of its chief characters is given.

The cupule possesses long filamentous scales, which give to the fruit the so-called "mossy" appearance. The acorns, which are sessile, take two years to mature; so that acorns, in some stage or other, may always be found on a fertile tree. The leaves are very dark green in colour, and have generally narrow and acute lobes. Multiple hairs are conspicuous: the petioles are long; and the buds, particularly the terminal ones, have long filamentous outer scales. In this country, the tree thrives on dry sandy soils, but the timber is of little value. *Q. Cerris* is said to hybridize with *Q. sessiliflora* and with *Q. lanuginosa*.

So far as I am aware, no Oak other than the foregoing are ever met with in the woods of this country. *Q. Ilex*, the Evergreen Oak, is frequently planted in parklands and ornamental grounds in the south of England; and Mr. Druce includes this species in his very catholic list.

Of the three Oaks—*Q. lanuginosa*, *Q. sessiliflora*, and *Q. Robur*—united by De Candolle into one aggregate species, it seems likely

that *Q. lanuginosa* is the most primitive, as it conforms most nearly with the forms met with in Tertiary strata. It may be that *Q. sessiliflora*, which is more closely allied to *Q. lanuginosa* than is *Q. Robur*, arose from *Q. lanuginosa* at a comparatively recent date; and that *Q. Robur*, in its turn, sprang from *Q. sessiliflora*. The distribution of *Q. lanuginosa* suggests that it may be a pre-glacial species. Perhaps during the time of floral strain and stress which followed the retreat of the ice, *Q. sessiliflora* branched off as a semiglabrous mutant of *Q. lanuginosa*, and *Q. Robur* as a glabrous mutant of *Q. sessiliflora*. The floral battle fought out between the two species (*Q. sessiliflora* and *Q. Robur*) resulted in the latter and more glabrous species becoming adapted to life in the deeper soils of the genial lowlands, whilst *Q. sessiliflora* became adapted to the shallower and, on the whole, the non-calcareous soils of the bleaker and colder uplands. Some of the variations of *Q. Robur* and *Q. sessiliflora*, such as the subspherical acorns of one form of *Q. sessiliflora*, appear to be of the nature of discontinuous variations. Other variations, however, such as those connected with the length of the peduncle, appear to be, to some extent at least, fluctuating variations, the extreme forms of which, however, are very well marked. Some of the characters, such as the greater hairiness of some forms of *Q. sessiliflora*, resulting from these mutations and variations, are almost certainly of some advantage to their possessors; whilst other characters, such as the leaf-auricles of *Q. Robur*, and the subspherical shape of the acorns of one of the varieties of *Q. sessiliflora* appear to offer no demonstrable advantage whatever to the individuals possessing them.

Key to the British Oaks.

The following key will be useful in determining the species of Oak likely to be met with in the natural or semi-natural woods of the British Isles:—

A.—Fruit taking two summer seasons to mature. Cupules "mossy." Terminal buds with many long filamentous scales. Leaves with multiple hairs. . . . . 1. *Q. Cerris.*

B.—Fruit ripening in a single season. Cupules not "mossy." Leaves glabrous or not.

(*a*) Leaves with multple hairs on the under surface, without auricles.

α. Young twigs, petioles, bud-scales, and leaves with multiple hairs. . 2. *Q. lanuginosa.*

β. Young twigs and petioles glabrous or almost glabrous. Leaves with multiple hairs, which, however, may be very small. . . . 3. *Q. sessiliflora.*

(*b*) Leaves bi-auriculate. Multiple hairs absent. . . . . 4. *Q. Robur.*

(*c*) Leaves bi-auriculate. Multiple hairs present. . . . . 5. *Q. Robur* × *sessiliflora.*

Summary.

1. There are two species of Oak, *Q. Robur* and *Q. sessiliflora*, native to the British Isles.

2. As a native tree, *Q. Robur* occurs abundantly on the following soils:—(a) *non-calcareous:* deep gravels, sands, and clays; (b) *calcareous:* deep marls, and on shallow marls over limestone and (most rarely) chalk, and on fen peat.

3. As a native tree, *Q. sessiliflora* occurs abundantly on shallow non-calcareous soils, less frequently on shallow calcareous soils, and locally on deep dry sandy soils.

4. Each species is sometimes dominant in wet woods, and sometimes in dry woods.

5. The altitudinal limit of *Q. Robur* in the south of England is about 880 ft. (268 m.), and about 600 ft. (182 m.) in the north of England.

6. *Q. sessiliflora* is dominant in woods up to about 1000 ft. (302 m.) on hills in Britain, especially in the west and north. Above that altitude, it occurs rarely up to about 1200 ft. (363 m.).

7. *Q. Robur* and *Q. sessiliflora* produce a natural fertile hybrid whose occurrence in Britain is widespread.

8. *Q. lanuginosa* has been recorded from England; but the records are of an extremely questionable nature.

9. *Q. Cerris* is frequently planted in England, and in a few cases it has established itself from self-sown seeds.

10. The difficulties which many botanists and foresters have hitherto experienced in correctly relating the native British Oaks are attributable to the following causes:—

(*a*) The incorrect descriptions in the standard works of reference.

(*b*) The failure to appreciate the amount of variation in the lengths of the peduncle and petiole of both *Q. Robur* and *Q. sessiliflora*.

(*c*) The failure to realize the constancy of the presence of leaf-auricles in *Q. Robur* and of multiple hairs in *Q. sessiliflora*.

(*d*) The hitherto unsuspected and widespread occurrence of the Hybrid Oak in Britain.

(*e*) The extremely confused state of the synonymy of the species, and the absence of type-specimens in herbaria.

Explanation of Plate 502.

Quercus Robur × *sessiliflora* (drawn from nature by Mr. E. W. Hunnybun).

1. Flowering branch. 2. Young leaf (upper surface). 3. Mature leaf (lower surface). 4. Mature leaf (upper surface). 5. Infructescence. 1–5, ⅓ nat. size. 6. Portion of leaf (lower surface), × 5. 1 and 2 drawn from a specimen gathered in May, 1909. 3–6 from specimen gathered October, 1909. All specimens from the same tree. Specimens from the same tree have been sent to both the British Exchange Clubs for distribution. The lithograph is reduced from the original drawing (natural size) to ⅕ natural size.

NOTES ON THE FLORA OF FLINTSHIRE.

By A. A. Dallman, F.C.S.

During the past two years I have devoted considerable attention to the vegetation of Flintshire. In this period I have travelled some fifteen hundred miles on foot alone in investigating the flora of the county, and there are now comparatively few localities in Flintshire which have not been visited. Of course much yet remains to be accomplished, especially in regard to the cryptogamic portion of the flora, and there is no doubt that further investigation of several promising localities will be well repaid. As many new facts have come to light it may be well to place some of this work on record, and I venture to think that the present paper, in conjunction with the two previous contributions published in this Journal for 1907 (pp. 138–153) and 1908 (pp. 187–196, 222–230), will go far towards rescuing this much-neglected county from its position of botanical oblivion.

Last August and September I spent some six weeks in the county, and the time was mainly devoted to a systematic investigation of the flora. Some attention was also paid to the ecology, pollination, and insect visitors of various species. These aspects of the subject may perhaps be dealt with in a separate contribution at some future date. In the present paper I have confined myself mainly to the systematic botany of the county. The Cryptogamia, Pteridophyta excepted, are excluded; some notes and records, mainly in connection with Bryophyta and Lichenes, will probably form the subject of a subsequent paper.

Notes on a number of aliens are incorporated with the present paper, as this aspect of the Flintshire Flora has hitherto received scant attention. Many of these waifs and strays are of course very ephemeral, but it is perhaps as well that they should be noted. As an instance of the evanescence of many of these plants, *Ambrosia artemisifolia* may be cited. In 1906 this North American species was growing in considerable quantity about the ruined mill behind Greenfield Abbey. There was at that time a large patch of some three or four hundred plants. Last August, three years later, when I visited this spot I failed to find a single example. On the other hand, aliens are sometimes remarkably persistent in a given locality. *Lepidium Draba* affords a case in point. This was first recorded growing by the Dee shore some sixty years ago; it is now quite a common plant in various places along the estuary from Saltney to Bagillt. On the Dee Embankment for a distance of half a mile or so north-west of the Bettisfield Colliery it is the predominant plant. Here it grows in large masses in the interstices of the stones of the embankment practically to the exclusion of everything else. Further on where the bare stones are succeeded by a layer of turf the *Lepidium* disappears.

Flintshire is not a favourable county for aliens owing to the absence of large industrial centres and ports, and there are no

canals. In this respect it compares unfavourably with a district like South Lancashire. The quays and adjacent ground at Mostyn and Connah's Quay have yielded a number of examples which in many cases have been introduced with iron ore, or sometimes it may be with coal. A good deal of timber is also imported here, but, though a possible medium for the introduction of alien plants, I have not so far observed any species which I consider to have originated in this way. In many cases the railways are responsible for the introduction or extension, sometimes both, of various aliens. Examples of this type are *Linaria minor*, *Senecio viscosus*, *Epilobium angustifolium*, *Diplotaxis muralis*, various species of *Melilotus*, &c. Sometimes the railway may be responsible for extending the range of a more or less local species which is indigenous to the county, e. g. *Silene nutans*. The ground in the vicinity of the Dee Oil Works at Saltney is deserving of attention, and will doubtless yield some additions to the alien list.

I have been favoured with considerable information and assistance of various kinds from several friends. In this connection I have to thank Mrs. Macdonald (Cwm), Mrs. New (Mollington), and the Misses Payne and Miss F. M. Thomas, of Chester; also the Rev. W. Wright Mason, B.A. (Bootle), Dr. H. Drinkwater, F.R.S. (Wrexham), Messrs. R. H. Day (Cwm), A. Newstead (Chester), and J. A. Wheldon, F.L.S. (Liverpool). To Miss Thomas I am under special obligations. I have also to thank Mr. E. E. Lowe, F.L.S., of the Leicester Museum, for aid in the identification of various insect visitors, Diptera in particular. Owing to an oversight a number of conjoint records of Mrs. New and the Misses Payne in my second paper (1908) were ascribed solely to the latter; the following which were credited to the Misses Payne are due to Mrs. New:—*Viola odorata*. *Silene latifolia*, *Hypericum quadrangulum*, *Melilotus altissima*, *Cichorium Intybus*, and *Chenopodium rubrum*. I have seen most of the plants in the localities to which Mr. Day's name is attached.

The herbaria of two former Chester botanists, Miss E. Potts (*Herb. Potts*) and the Rev. James Harris (*Herb. Harris*), which are preserved at the Grosvenor Museum, Chester, contain a number of Flintshire plants, and I have included the more noteworthy of these records in the present paper. Miss Thomas called my attention to an old *Botanists' Manual* in the library of the Chester Society of Natural Science. This little book—anonymous and undated—appears to have been a forerunner of the *London Catalogue*. It was formerly the property of Miss Potts, and bears her name and the date, July 1838, on the cover. It seems to have served as a catalogue of the herbarium, but amongst the localities which are entered in Miss Potts's writing opposite the various species there are several referring to Flintshire which do not appear to be represented by specimens. Species which are additions to the county list are indicated by an asterisk.

Clematis Vitalba L. Hedge on left of road just outside Northop, towards Connah's Quay; one plant in hedge on north

side of road near Pontryffudd, near Bodfari; between Mostyn Quay and the Station (extension of previous record); hedge by Henblas, Tremeirchion (garden escape).

Thalictrum minus L. α *collinum* Wallr. Craig Fawr, Meliden, *Day & A. A. D.*

Ranunculus Drouetii F. Schultz. Frequent in the Clwyd from Rhuddlan to Pontryffudd.—*R. Lenormandi* F. Schultz. By little pool on north side of Cwm Mountain, *Day*; Caergwrle, *Mason* (sp.); swamp between Gwern and Talwrn Glâs, south-west of Llanfynydd; Hope Mountain; above a farm called Coventry, south-west of Cilcain, at 850 ft.—*R. sceleratus* L. Sealand, *New*; ditches near Bretton, *Thomas*. Frequent along the littoral portion of the county, extending from Rhyl to Sealand.—*R. parviflorus* L. Caergwrle, May 13, 1869, *Herb. Harris*.—*R. Flammula* L. var. **pseudo-reptans* Syme. Not uncommon in swampy situations in the hill country.

Helleborus viridis* L. By Tu Uchaf, north of Cilcain, May, 1909, *Miss F. Mulcahy*.—H. fœtidus* L. Nant-y-Ffrwd [*i. e.* Nant-y-Ffrith], near Wrexham, May, 1836, *Herb. Potts*. This may be either Flint or Denbigh, as the county boundary runs along the north side of this valley.

Aquilegia vulgaris L. Hedgerow in lane near Pen-y-felin, near Nannerch; bank of lane between Llyn Du and Pant, near Caerwys; by a cottage below Cilcain Vicarage (garden escape); lane near Pant-Gwyn, near Ysceifiog; north side of road between Groesfaen and Bryn Cloddiau, near Caerwys; roadside between Brynford and Holywell (one plant only); hedgebank about two miles from Caerwys on road north of 'Black Lion Inn' towards Babell.

Berberis vulgaris L. A large clump at corner of cart-track leading up to back of Halkin Hall; in a hedge on the north side of the road (between Nannerch and Caerwys) a little past the 'Swan Inn,' towards Ddol; one bush in a garden hedge, Graig, Tremeirchion; hedge by Saithfynnon between Whitford and Holywell.

**Castalia alba* Wood. In a small pond by Lygan-y-Wern below Pentre Halkin at about 570 ft. A curiously rare plant in Flint.

**Papaver somniferum* L. Waste ground near Mold; a weed among oats near Glan-yr-afon, near Rhydymwyn; a weed in Mold Churchyard; rubbish heap by Rhuddlan Foundry; waste ground top of Caerwys Hill; railway embankment south-east of Shotwick.—*P. hybridum* L. Rhyl, *Herb. Potts*.

Chelidonium majus L. The flowers are devoid of honey, and appear to be homogamous. A large patch by Celyn Maly, near Cilcain, at about 650 ft. elevation, was frequently visited by *Platychirus albimanus* Fab., *Mydæa urbana* L., *M. impunctata* Fall., and *Ascia podagrica* Fab.

Corydalis lutea DC. Wall of farm called Tyddyn-y-cyll, near Cwm; an escape on wall by road between Greenfield and Holywell.

Fumaria officinalis L. Rhyl, *Mason*; plentiful in a cornfield, Marian, near Cwm; Nannerch; between Tyn-twll and Plas Yw, near Nannerch; field near Afon wen, Caerwys.

**Radicula sylvestris* Druce. Island in Elwy, just above junction with the Clwyd, Sept. 1909, *Day & A. A. D.*; banks of Clwyd between St. Asaph and Rhuddlan; by Clwyd above Pont-y-Cambwll.—*R. palustris* Moench. By Clwyd above Pont-y-Cambwll; island in Elwy just above junction with the Clwyd, *Day & A. A. D.*; banks of Clwyd between Rhuddlan and St. Asaph.

Arabis hirsuta Scop. Moel Findeg, at about 1000 ft.

**Sisymbrium pannonicum* Jacq. A number of plants along the Ochr-y-Foel road just above Dyserth Station (*Liverpool Bot. Soc.*, Field Meeting, July 3, 1909); waste ground between mouth of Wepre Brook and Connah's Quay, July 29, 1909; about the wharf at Connah's Quay; a single plant on waste ground behind west platform of Nannerch Station, August, 1909.

**Erysimum cheiranthoides* L. Two plants by chemical works near mouth of Wepre Brook, July 29, 1909.

**Camelina sativa* Crantz. Two plants by the quay at Connah's Quay, July, 1909.

**Brassica Napus* L. Rhyl, 1841, *Herb. Potts*; Rhyl, 1909, *Mason* (sp.), 1909; railway sidings, North Hendre Lead Mine, near Rhydymwyn.—*B. nigra* Koch (*sinapoides* Roth). Along ditch by lane below the 'Marsh Inn,' Rhuddlan.

Diplotaxis muralis DC. Prestatyn end of Rhyl sandhills, *Thomas*; Rhyl, *Mason* (sp.); scattered among cinders, &c., in the railway track of the sidings about the North Hendre Lead Mines, 1909.

**Neslia paniculata* Desv. Several plants by the sidings of the North Hendre Lead Mines, August, 1909.

Coronopus procumbens Gilib. Roadside near Mynachlog, near Northop; near the entrance to Rhuddlan Station; footpath between Rhyl and Rhuddlan.

Lepidium latifolium L. Rhyl, 1842, *Herb. Potts*.—*L. ruderale* L. By lane below the 'Marsh Inn,' Rhuddlan, 1909.—*L. Draba* L. Saltney, *New*; on the Cop beyond Saltney, *Thomas* (sp.); Dee Embankment, abundant in the crevices of the stones in several places between Bagillt and Mostyn.—*L. heterophyllum* Benth. (*Smithii* Hook.). Roadside between Tyntwll and Plâs Yw, near Nannerch, at 750 ft; roadside above Bryn Goleu, Cwm.

Thlaspi arvense L. A weed in St. Beuno's Garden, 1908, *Stapleton* (sp.).

Cakile maritima Scop. Shore in angle between Mostyn Quay and the Station.

**Raphanus Raphanistrum* L. A weed about Foryd, near Rhyl; waste ground between mouth of Wepre Brook and Connah's Quay; railway sidings by the North Hendre Lead Mines near Rhydymwyn.

Reseda lutea L. On the Cop beyond Saltney, *Thomas*.—*R. Luteola* L. Island in Elwy, just above junction with Clwyd, *Day*; railway embankment south-east of Shotwick; abundant along an

embankment in field on Cheshire side of the Dee, north-west of Hawarden Bridge; Dee Cop, Saltney, near the county boundary; Dyserth; Marian, Cwm; waste ground by Bettisfield Colliery, near Bagillt; about lead works in the Leet; Coed Talon; between Rhuddlan and Cwm; along the Nant Brook above Pont Bleiddyn; between Tryddyn and Coed Talon; Cwm; waste ground between mouth of Wepre Brook and Connah's Quay; on furnace refuse and alkali waste below Pentre, south-east of Flint; Llanfynydd; about the Mostyn Iron Works; about the lead works, Llannerch-y-mor. Frequently occurs on furnace and colliery refuse and alkali waste, and appears to thrive even in the smokiest situations. In some instances this plant is water-borne: such is evidently the case along the brook above Pont Bleiddyn, and on the islet in the Elwy. As the minute seeds are only slightly heavier than water—their relative density I find to be 1·034—when, as frequently occurs, they happen to fall into running water, they are often carried a considerable distance. When, as may also sometimes happen, the fruits become detached and fall into running water they will travel a much greater distance. Additional buoyancy is given by the air space in the open capsule, and from the wrinkled nature of the fruit the contained air can only be dislodged with some difficulty. The fruits (with enclosed air) have a relative density of 0·343. After boiling for some time to dislodge the contained air the capsules were found to have a relative density of 1·142. Out of a handful of these fruits which I dropped into the Clwyd at one point, I found that a number were carried almost a mile down the river. At this distance I lost sight of them owing to my having to make a considerable detour in order to avoid some swampy ground. No doubt many of them were carried much further.

Viola palustris L. Swampy ground near Gwern; swampy ground by stream north-west of Pen-y-Cloddiau. — *V. odorata* L. Sealand, *New*; near Bretton, *Thomas*; near Tyn-twll, south-east of Penbedw Hall, near Nannerch (alt. circa 520 ft.), May, 1909, *Miss F. Mulcahy*; hedgebank on Caerwys Hill, just above the Presbyterian Church; lane above Wal-goch, near Nannerch; between Llyn Helyg and Caerwys; roadside south of the Workhouse, St. Asaph; near Nannerch Church, towards Waen Dymarch; bank by roadside between Pontryffudd and Bodfari Station; between St. Asaph and Cwm; near Rhyllon, near St. Asaph. — *V. hirta* L. Pandy Lane, Dyserth, *Day*; roadside near Tyddyn Farm, Llong; between Afon wen and Ddol; between Caerwys and Llyn Helyg; Craig Fawr, Meliden; bank by road about a mile south of Nannerch Station.—*V. arvensis* Murr. var. **Lloydii* Jord. Cornfield, Marian, Cwm (fide *Wheldon*).

**Dianthus Caryophyllus* L. Wall between Greenfield and Holywell. Probably of garden origin.

Saponaria officinalis L. Rhyl, *Mason*. In great abundance on the island in the Elwy, just above the junction with the Clwyd, *Day & A. A. D.*

Silene nutans L. Slopes of embankment of bridge over railway

north-west of Ty newydd near Rhyl, *Mason* (sp.). No doubt the railway is responsible for its introduction here from the "locus classicus" at Talargoch and Meliden, some three miles distant.

Cerastium viscosum L. Attains greatest Flintshire elevation on Moel Fammau, where it grows in crevices of the walls about the summit of the Jubilee Tower—the highest point in the county —alt. 1840 ft.

**Stellaria apetala* Ucria (*Boræana* Jord.). Between Nannerch Church and the railway bridge, 1909.—*S. neglecta* Weihe. Lane close to 'Miners' Arms,' Meliden, *J. B. Parker* (sp.).—*S. nemorum* L. Mr. Day and I were pleased to find this still growing about Rhyd-y-ddaudwr, by the Clwyd above Rhuddlan, in September last. This confirms Bingley's record of more than a century ago (1804). Rhyddlan, August, 1842, *Herb. Potts.* Appears to be scattered along the Clwyd here and there, from near Rhuddlan to Pontryffudd. Sparingly on the island in the Elwy just above the junction with the Clwyd. Pont-y-Cambwll, on both the Flint and Denbigh sides of the river; wood by Clwyd, Melyn-y-Green.

Arenaria verna L. Lead mine refuse near Gorsedd; about the Hendre Lead Mine near Rhydymwyn.—*A. leptoclados* Guss. Roadside, Marian, Cwm: the Leete.—*A. peploides* L. Near Rhyl, *Mason*; stone embankment of railway at Flintshire end of bridge, over the Clwyd at Foryd.

Sagina maritima Don. Rhydlan [*i.e.* Rhuddlan], very fine, *Herb. Potts.*

Montia fontana α **minor* All. North side of Cwm Mountain, *Day & A. A. D.* I have also observed this in a number of other localities. The variety β *major* All. also occurs.

[**Tamarix gallica* L. About the Marine Lake near Rhyl (planted).]

Hypericum Androsæmum L. Hedge by lane below Plas-is-llan, about two and a half miles east of Rhuddlan; bank of lane, east of where it crosses the stream, above Glyn ganol, near Caerwys.—*H. quadrangulum* L. Walwen near Lixwm; between Bryn bella (Tremeirchion) and Pont-y-Cambwll.—*H. pulchrum* L. Wood fringing lake below Ysceifiog; lane above Tyn twll, near Nannerch; between Gelli Farm and the railway, near Nannerch; between Lixwm and Ysceifiog; wooded hill north of Moel Findeg; between Nannerch Mill and the village; Cwm; between Waen Dymarch and Nannerch; road from Nannerch towards Llandyrnog.—*H. hirsutum* L. Bank by road about half a mile south-west of Llong Station; roadside between Pen uchaf and Aelwyd uchaf (above Tremeirchion).—*H. montanum* L. Caerwys; bank by Bwlch, near Cwm; between Caerwys and Bryndu; Lixwm; between Caerwys and Llyn Helyg; about valley below Ysceifiog; between Lixwm and Ysceifiog.

Malva moschata L. Roadside between Sarn Mill and Afon wen; between Bodfari and Caerwys; between Tremeirchion and Bodfari; between Mold and Llong; Padeswood; between Cwm and Rhuallt; Hendre near Rhydymwyn; between Rhos-esmor and Northop; between Rhuallt and Tremeirchion; between Nan-

nerch and Rhydymwyn; between Leeswood Hall and Broomfield Hall; on limestone rocks by the lake below Ysceifiog.—*M. sylvestris* L. Bretton, *Thomas*; Holywell; Llong; Bagillt; Mostyn Quay; Rhuddlan; Flint Castle; Cwm; St. Asaph; island in Elwy above junction with Clwyd, *Day*; Glan-y-Morfa near Bodelwyddan; Flint; Connah's Quay; Tremeirchion Caves; Rhyl; Prestatyn; Foryd near Rhyl.—*M. rotundifolia* L. Rhyl, *Mason*; St. Asaph; Ysceifiog; Cwm; Rhuddlan; near Caerwys; roadside east of Bodfari; Northop.

Linum usitatissimum L. Waste ground by railway, north-east of Mold; several plants by the sidings, St. Asaph Station.

Geranium phæum L. A patch on roadside close to a cottage called Ty Bedw near Bryngwyn Villa, about one and a half miles from Bodfari Station.—*G. pratense* L. This is a rare plant in Flintshire, and I was pleased to rediscover it still existing (Sept. 1909) in quantity in the locality given by Waring in the *Philosophical Transactions*, lxi. (1772), *i.e.* "In the field which is next above the Bridge called Pont Llong, and between the Rivers Alen and Terrig in this township of Leeswood." It also extends from here over the hedge-bank into the road leading from Leeswood Hall to Llong Station. Road from Cefn-y-Bedd Station to Hope Mountain, *Drinkwater*. One or two plants in lane nearly opposite Cwm Church.—*G. pusillum* L. Near Rhyl (*Price*), *Herb. Potts*; summit of Moel Hiraddug, *Liverpool Bot. Soc.*; Craig Fawr, Meliden; on limestone rocks immediately above Tremeirchion Caves.—*G. columbinum* L. Along the roadside from Bodfari Station towards Pontryffudd; in quantity, extending for some distance along lane which runs above and almost parallel to the Alyn near Ty draw Farm, near Mold; two or three plants only by roadside opposite Bryn Nannerch.—*G. dissectum* L. Near Glan-y-morfa, near Bodelwyddan; laneside between Tyn twll and Plâs Yw near Nannerch, alt. 780 ft.—*G. lucidum* L. Wall near Rhual, near Mold; between Caerwys and Byrn du; near Nerquis; wall at Shop Mynydd, Hope Mountain, at about 850 ft.—*G. pyrenaicum* Burm. fil. Hedge-bank by Henblas, Tremeirchion; roadside between Mold and the bridge over the Alyn; plentiful along roadside between Broomfield Hall and Nerquis; one patch by road between Leong Station and Leeswood Hall; roadside between Pentre Mill and Llong. Flowers on the roadside between Mold and Llong, at about 330 ft. elevation, were being commonly visited (in August) by *Syrphus ribesii*, L., and another smaller and undetermined species of *Syrphus*. An Aculeate (*Halictus*?) was also observed as an occasional visitant.

Erodium maritimum L'Hérit. This is recorded in the *Botanists' Guide* as being "plentiful about Flint Castle." In the Supplement to Dickinson's *Flora of Liverpool* (1855) it is stated that "Dr. Wood finds it growing plentifully on the opposite side of the Dee at Flint." After carefully searching this uninviting locality, I am convinced that *E. maritimum* must have long become extinct here. The ground hereabouts is nowadays quite unsuited to the growth of such a plant, and, assuming that it formerly grew here,

there is little doubt that its disappearance is correlated with the advent of the alkali works which all but enclose the historic ruin. Fortunately the plant still occurs in Flintshire in at least two stations.

Euonymus europæus L. In a limestone gully on the south side of Craig Fawr, Meliden, at about 400 ft., *Day & A. A. D.*; several bushes on the top of the stone bank by road by Halkin Hall; one bush by some elms on west side of lonely lane above the Hawarden Waterworks Company's reservoir on the north slope of Moel Fammau (alt. circa 980 ft.); in the dense thicket behind the powder house, Hendre Lime Works near Rhydymwyn, and one shrub near road below; on steep limestone rocks above the railway just before reaching Hendre Lime Works.

Rhamnus catharticus L. In the thicket behind and above the powder house, Hendre Lime Works near Rhydymwyn. I only saw one bush, but doubtless more occur.

Acer campestre L. In quantity in hedgerows below a farm called Cerrig-llwydion bach, before reaching the railway bridge over the road, nearing Connah's Quay from Northop; hedge on road between Saithfynnon and Golch, between Whitford and Holywell; east of Ty-gwyn, between Rhuddlan and Cwm, before coming to the crossroads; wood by road between St. Asaph and Bodelwyddan; wood south of Northop; one small bush in hedge skirting railway, opposite some cottages below the Golf House near Hawarden Bridge; hedge by road immediately south-west of Kinnertonbridge Farm; one example in lane leading from the Cilcain Road to the Factory Pool, near Mold; Llanfynydd; between Pont Bleiddyn and Pont-y-Bodkin; Ffrith; wood between Brynbella (Tremeirchion) and Green Bach; hedgerow between Mostyn and Tre Mostyn.

Genista tinctoria L. Bank by roadside between Pont-y-Cambwll and Green Bach. [This also occurs by the roadside near Lower Kinnerton towards Bretton, but the station is just a few yards beyond the Flint boundary.]

Cytisus scoparius Link. On island in Elwy just above junction with Clwyd, *Day*. Bryn-goleu, west of Nannerch, ascending to 920 ft.; between Waen Dymarch and Nannerch; by lake near Ysceifiog; racecourse near Pantasaph; between Bryngwyn Villa and Glynisaf; between Caerwys and Bodfari; about Nant-y-Ffrith Hall, ascending to 1050 ft.

Ononis repens L. Sealand, *New*; south of Pen-y-fford near Brynford; Hawarden Bridge; Dyserth; Soughton; near Caerwys; by lane south of Padeswood Station, and between the station and the pool.—*O. spinosa* L. Between Cwm and Rhuddlan, *Day*; Dee Cop about Saltney and elsewhere; between Pont-y-Cambwll and Tremeirchion; near Rockcliff Hall; plentiful along coast between Golftyn and Oakenholt Cottage.

**Trigonella cærulea* Ser. Several plants with the casuals by railway sidings, North Hendre Lead Mines, Sept. 1909.

**Medicago denticulata* Willd. Three plants by railway sidings about the North Hendre Lead Mines, near Rhydymwyn, Sept. 1909.

Melilotus altissima Thuill. Railway bank near Golf Links [between Shotwick and Hawarden Bridge], *New*; abundant about Mostyn Quay, especially on the clay bank of the quay; waste ground by Bettisfield Colliery; one plant only by Nannerch Station, 1909; waste ground between mouth of Wepre Brook and Connah's Quay.—**M. alba* Desr. Waste ground between mouth of Wepre Brook and Connah's Quay, 1909.—*M. officinalis* Lam. (*arvensis* Wallr.) Railway sidings by North Hendre Lead Mines (one plant only).—**M. indica* All. Growing with the last species.

Trifolium fragiferum L. Sealand, *New*; Dee Cop.—*T. arvense* L. About Rhyl and Prestatyn.

Anthyllis vulneraria L. Trelogan; lead mine refuse below Gorsedd; Brynford.

Lotus corniculatus L. *β* **crassifolius* Pers. Rhyl, *Mason*; Prestatyn.—**L. tenuis* Waldst. & Kit. Golf Links near Hawarden Bridge, 1909.—*L. uliginosus* Schk. Marshy ground by stream above Caegwyn, near Tremeirchion; Moel-y-Parc, at 650 ft.; between Rhyd-y-Ceirw and Rhos uchaf, south of Tryddyn; near Gwern on the hills above Llanfynydd, at 1120 ft.

Vicia hirsuta Gray. Between Buckley Junction and Kinnerton Station, *Thomas*; railway embankment between Shotton and Connah's Quay; roadside between Llong Station and Leeswood Hall; by railway sidings by North Hendre Mines near Rhydymwyn; waste ground by Mostyn Iron Works.—*V. tetrasperma* Moench. Rhyl, *Mason*; Pandy Lane, Dyserth, *Day & A. A. D.*; between St. Asaph and Wigfair; plentiful on hedgebank by road below St. Beuno's College; field near Ty celynn, south of Cwm.—**V. lutea* L. Queensferry, *Mr. Shepherd*, *Herb. Potts*. This is an interesting record, and, in view of the former occurrence of this species in the adjoining county of Cheshire, it is not devoid of significance. The collector was doubtless John Shepherd (1764–1836), a former Curator of the Liverpool Botanic Gardens; this fixes the date as some time prior to 1837. Mr. F. M. Webb who saw *V. lutea* in situ on the Cheshire coast, prior to the station being destroyed by storms in 1863, was inclined to regard it as indigenous here. The question is discussed at some length in the *Flora of Cheshire*, by Lord de Tabley, who, while admitting the possibility of its being indigenous in Cheshire, is more disposed to regard it as a casual; he remarks that "between the coasts of Ayr and Somerset there is no authentic record of its native occurrence." The existence of this old Flintshire record, with which Lord de Tabley was not acquainted, strengthens the case for *V. lutea* having been a native in Cheshire. Queensferry is only some eleven miles distant from Caldy (the old Cheshire station), and both localities are situated on the Dee Estuary.

**Lathyrus Aphaca* L. A single plant with other casuals by the railway siding by the North Hendre Lead Mines, near Rhydymwyn, Sept. 1909.

Prunus Padus L. Llanfynydd; near Hill Farm, Llong; hedgerow, Glan-y-Afon between Rhydymwyn and Nannerch; hedge by some cottages between railway and Alyn, north-east of Mold;

hedges by roadside between Gwern-y-Marl and Northop; plenty in hedgerow south of Gwrychbedw near Nannerch (extension of a former record); lane from Cilcain Road to Factory Pool near Mold; side of lane near Ty Draw Farm near Mold.

**Spiræa salicifolia* L. Near Caerwys, 1909, *Payne*.—*S. Filipendula* L. Near Caerwys, 1909, *Miss Cummings*.

Rubus dasyphyllus Rogers. Cwm Wood (fide *Wheldon*).—*R. Selmeri* Lindeb. Waen Dymarch, near Nannerch.—[*R. saxatilis* L. It is doubtful whether this can be retained in the Flintshire list. I think the station in the St. Beuno's Flora "Top of Blackberry Lane" (*i.e.* lane between Aelwyd uchaf and Rock Chapel) is a very unlikely situation for the Stone Bramble. I have searched this locality on two occasions without result.]—*R. rusticanus* Merc. Frequent along the littoral portion of the county, and extends some distance into the hill country. It occurs at about 700 ft. on Halkin Mountain. From the gregarious habit and somewhat conspicuous masses of blossom the flowers are frequented by numerous insects. A number of plants growing on the side of the upland lane above Penbedw uchaf, southwest of Nannerch, at 830 ft., were visited by the following insects in the course of twenty minutes on a sunny afternoon towards the end of August:—*Vanessa urticæ* (occasional), *Pieris brassicæ* (occasional), *Bombus terrestris*, *B. muscorum* (both frequent), *Apis mellifica*, *Syrphus ribesii* L., *Lucilia Cæsar*.

**Potentilla norvegica* L. Several plants as a casual on waste ground behind the west platform of Nannerch Station, August, 1909.—*P. palustris* Scop. Small pond by Hope Exchange Station, 1909, *Drinkwater*; swamp between Gwern and Talwrn glas above Llanfynydd.

Alchemilla arvensis Scop. Halkin Mountain at 820 ft.; roadside, south of Afon Goch; roadside between Nannerch and Llandyrnog.

Poterium Sanguisorba L. Moel Findeg; Halkin Mountain.—*P. officinale* Gray. In considerable amount on north side of railway by the sidings of the North Hendre Lead Mine, near Rhydymwyn, Sept. 1909; by the railway crossing north-west of Nannerch Station, confined to the north side of the railway.

Rosa tomentosa Sm. Frequent; ascends to 880 ft. on Bryn Goleu near Nannerch.

Pyrus torminalis* Ehrh. A single tree growing on rocky side of limestone gully on south side of Craig Fawr, Meliden, at about 400 ft., Sept. 1909, *Day & A. A. D.*—*P. Aria* Ehrh. *β* **rupicola* Syme. Limestone rocks, Craig Fawr, Meliden.—P. communis* L. One tree in a hedge on an eminence by shore below Golftyn House, near Connah's Quay, July, 1909.

Ribes Grossularia L. Both forms, *α glandulosum* and *β Uva crispa*, are frequent. There is no doubt that in Flintshire, as in most places, this is largely bird-sown. The blackbird plays an important part in this distribution; and when in fruit one rarely passes a bush without disturbing one of these birds.—**R. alpinum* L. In hedge by footpath skirting wood by stream close to Waen

Dymarch, near Nannerch, Aug. 1909; by stream by road, north-east of Mold, near Rhydgaled.—*R. rubrum*, L. Ysceifiog; between Waen and Rhual, near Mold; between Nannerch Station and the Police Station. Like the gooseberry is usually bird-sown.

Sedum album L. Extending for some distance along wall of Kinmel Park by roadside, about one and quarter miles from Bodelwyddan; on a garden wall between Rhuddlan and Spital; on a farmyard wall, Crugyn, south-east of Rhuddlan.—*S. reflexum* L. In quantity and extending some distance along wall by the 'Blue Lion,' Cwm, *Day*; wall, Holywell; wall by Banqueting House, Rhuddlan, *Day & A. A. D.*; wall, Bodfari; wall near Rhual, near Mold; limestone rock by roadside south of Tremeirchion. The flowers are often visited by *Apis mellifica* for the sake of the honey which is secreted by the small hypogynous scales.

Sempervivum tectorum L. Roof of Pen-y-ucefn-chaf near Newmarket, *Miss L. R. Day* (sp.); Rhyl, *Mason*; old ruined cottage near Glan-y-Morfa, north-west of Bodelwyddan; Llanfynydd; old cottage between Babell and Llyn Du; near Tryddyn.

Drosera rotundifolia L. By stream above Hawarden Water-works, north slope of Moel Fammau, at 1150 ft.; by stream north-west of Pen-y-Cloddiau.

**Myriophyllum spicatum* L. Reservoir behind lead works, Llannerch-y-Mor, Sept. 1909; pond in Downing Park, about one-third of a mile north of Whitford Church, Aug. 1909; in the ditch or stream by Ty-Tywyrch, west of Rhuddlan.

Lythrum Salicaria L. By Elwy.

Epilobium angustifolium L. In Flintshire generally occurs on colliery refuse or railway banks. Humble bees are specially partial to this species. A few plants by front of Mount Farm above Llanfynydd, at about 970 ft.; skirting some marshy ground by road near Mostyn Station; by railway between Higher Ferry and Saltney; on colliery refuse below Coed Talon Station; railway sidings by North Hendre Lead Mines near Rhydymwyn; several plants by west platform of Mold Station, below the bridge; field adjoining chapel at Afon Goch; waste ground near Christ Church near Pont Bleiddyn; on colliery refuse between Padeswood Station and the pool; a few plants on a mound of colliery refuse between Llong and Padeswood.—*E. parviflorum* Schreb. Ditch by Marsh Hotel, Rhuddlan; ditches by Capel Morfa.—*E. palustre* L. Swamp between Gwern and Talwrn glas; moist ground to north of road below Nannerch; Clwyd about St. Asaph; pool by Padeswood Station.

**Œnothera biennis* L. Rhyl, *Mason*.

Bryonia dioica L. Plentiful in hedges between Flint and Bagillt.

Eryngium maritimum L. Rhyl, *Mason*.

Conium maculatum L. Rhyl, Aug. 1842, *Herb. Potts*; 1909, *Mason*; Bretton, *Thomas*; Sealand, *New*; island in Elwy above junction with Clwyd, *Day*; near Bryn Sion above Afon wen; Cwybr, between Rhyl and Rhuddlan; roadside about a mile west of Rhuddlan Station; rubbish by Rhuddlan Foundry; waste ground,

Flint; east of Rhuddlan; between Llanfynydd and Ffrith; waste ground by Bettisfield Colliery, Bagillt; between Bagillt and Flint.

Smyrnium Olusatrum L. By roadside just before reaching the two chapels on the Marian, Cwm.

**Bupleurum rotundifolium* L. One plant as a casual on waste ground by the Mostyn Iron Works, Aug. 1909.

Apium graveolens L. Extends all along littoral portion of the county, from Rhuddlan and mouth of Clwyd to Saltney. *A. inundatum* Reichb. fil. Margin of pool by cross roads near a farm called Pant, about three-quarters of a mile south-west of Llyn Helyg; pool by roadside a mile or so north-west of Croes Waen near Caerwys; pond in Downing Park about one-third of a mile north of Whitford Church; Leyn Du, north-east of Caerwys.

Sison Amomum L. Broughton, Aug. 25, 1869, *Herb. Harris*: Bretton, *Thomas*; plentiful along road between Pont-y-Cambwll and Green Bach; between Bodfari and Pontryffudd.

Sium erectum Huds. Near Bretton, *Thomas*; pool by Padeswood Station.

Myrrhis Odorata Scop. By River Cegidog, east of Cae Hic; roadside between Rhos-esmor and Northop; quarry at top of Caerwys Hill.

Anthriscus vulgaris Bernh. Rhyl, *Mason*.

Fœniculum vulgare Mill. Island in Elwy, *Day*; Dyserth; waste ground by Bettisfield Colliery; several clumps by road above Dyserth School.

Œnanthe Lachenalii C. Gmel. A specimen in Miss Potts's herbarium from Rhyl, and labelled *O. pimpinelloides*, is the present species. Ditches about Capel Morfa.—*O. aquatica* Poir. (*Phellandrium* Lam.). I was pleased to notice several plants by the large pond in Downing Park, about one-third of a mile north of Whitford Church, in August, 1909. In Journ. Bot. 1908, 193, I expressed some doubt as to the occurrence of this plant in the county, the sole record dating back to 1796, in Pennant's *History of the Parishes of Whiteford and Holywell*. As Pennant resided at Downing, and as there is no other suitable habitat for this plant in the neighbourhood, I think it is almost certain that this is his station. An interesting confirmation of the old record.

Silaus flavescens Bernh. Near Bretton, *Thomas*; west of Rhuddlan towards county boundary; between St. Asaph and Cwm; road near Pen-y-Palmant, north-east of St. Asaph; between Rhuddlan and Cwm; between Bodelwyddan and St. Asaph; lane from Bodelwyddan Road to Glan-y-morfa; between Llannerch and St. Asaph; between Brynbella (Tremeirchion) and Pont-y-Cambwll. The greatest elevation at which I have yet noticed this is on the road near Plas-yn-Cwm, where it ascends to 240 ft.

**Peucedanum Ostruthium* Koch. Nant-y-Ffryd [*i.e.* Nant-y-Ffrith] near Wrexham. Probably introduced, *Herb. Potts*. This may be in Denbigh.

Angelica sylvestris L. Appears to be a favourite wasp flower. Markedly entomophilous like most Umbelliferæ. Syrphidæ—*Syrphus ribesii* and *Eristalis tenax* in particular—are frequent visitors.

**Coriandrum sativum* L. Two plants as casual about the railway by the North Hendre Lead Mines near Rhydymwyn, Sept. 1909.

Caucalis nodosa Scop. Grassy embankment by Dee, opposite Hawarden Bridge Iron Works. Rather stunted and more or less prostrate; this habit is perhaps the result of the plants having to continually contend with cattle. Tremeirchion Caves.

Cornus sanguinea L. Road from Bodelwyddan towards Abergele; by the lake below Ysceifiog; hedge in road west of Llyn du; one shrub in hedge north of Celyn Maly near Cilcain; between Ffrith and Llanfynydd; between Ddol and Afon wen; road between St. Asaph and Llannerch; between Wigfair and St. Asaph; road south of Pen-y-fford near Brynford; one bush in elm hedge by road a mile or so west of Rhuddlan Station; lane below Pen-y-ffrith north-west of Bodelwyddan; near Plas-yn-Cwm below Cwm; Lixwm.—**C. alba* L. This Siberian species is naturalised in a wood by road between Rhydymwyn Station and Mold. It also occurs in a wood near Coed Du.

Sambucus Ebulus L. A large clump by roadside in Pandy Lane, Dyserth, just above the stream, 1909, *Day & A. A. D.* Pollination is frequently effected by a minute hemipterous insect which infests the flowers, which I have been unable to identify. A large flowering clump which I kept under observation on a dull afternoon towards the end of August (growing at some 500 ft. elevation), for an hour and a half, was visited by the following:—*Mydæa urbana* L. (frequent), *M. impunctata* Fall, *M. separata* Ung., *Onesia sepulchralis* L. During this time the flowers were not visited by a single bee of any description. The blossoms were apparently intentionally avoided by Apidæ, as a number of flowers of *Rubus discolor* and Black Knapweed, which were interspersed, received numerous visits from humble and hive bees during the same time. In the Alps, according to Müller, the flowers are regularly visited by *Apis mellifica* and humble bees.

Viburnum Opulus L. Between the 'Old Cross Keys" Inn and Bilberry Woods, *Thomas*; near Mostyn; between Coed Talon and Pont Bleiddyn; hedge near Nannerch Mill; lane between railway and Gelli, near Nannerch; between Walwen and Halkin, at about 750 ft.; between Caerwys and Bryn Du; lane near Plas Wilkin, Rhydymwyn; road between Bagillt and Lygan-y-Wern; south-west of Tryddyn; Ffrith; Llanfynydd; by the Clwyd above Pont-y-Cambwll; between Bodfari Station and Pontryffud; between Greenfield and Llannerch-y-mor; hedgerow in lane between Plas-yn-Cwm and Ty Celyn, near Cwm; thicket behind Powder House, Hendre Lime Works, near Rhydymwyn; wood opposite Tyddyn On; hedges between Sarn Mill and the chapel, on the way to Nannerch; between Afon wen and foot of Caerwys Hill; between Rhydymwyn Station and Coed Du; hedgerow below chapel above Rhos Isaf, near Llanfynydd, at about 700 ft.—**V. Lantana* L. A number of bushes in hedge near some cottages between Llong and Padeswood, 1909.

Rubia peregrina L. Hedges in lane between Pentre Cwm and

Dyserth. There are specimens in the Harris Herbarium marked "Dyserth, July, 1863. Jos. Whittaker."

**Galium Mollugo* L. Sealand, *New*; the Leet; near Nannerch.

(To be continued.)

THE NAME *ALECTOROLOPHUS*.

By W. P. Hiern, F.R.S.

In the recent part (6) of his *Prodromus Floræ Britannicæ* (1909) Mr. Williams adopts the name *Alectorolophus* for the plants which appear in British floras under *Rhinanthus*. For this—while disclaiming the discussion of nomenclature—he gives his reasons at some length, and it may be of interest to reproduce these, with certain comments which they suggest. He says:—

"Without entering upon questions of nomenclature, many botanists will agree that it is better to follow the monographer of the genus in adopting the name of *Alectorolophus* in preference to *Rhinanthus* Linn. Dr. von Sterneck devoted some years to the critical investigation of the variable forms grouped under the genus, and his monograph, modelled upon Prof. von Wettstein's work on *Euphrasia*, gives evidence of long and conscientious study. His conclusions, on the whole, will probably stand the test of time, and his judgement is entitled to respect. The following list exhibits the disintegration of the genus *Rhinanthus* of Linnæus, who enumerates seven species:—

Rh. orientalis = Rhynchocorys orientalis *Benth.*
Rh. Elephas = Rhynchocorys elephas *Griseb.*
Rh. Trixago = Bellardia trixago *All.*
Rh. capensis = Bellardia trixago *All.*
Rh. indica = Geniosporum elongatum *Benth.* (Lamiaceæ).
Rh. virginica = Gerardia quercifolia *Pursh*; while the type-specimen in Herb. Linnæanum = Lamourouxia serratifolia *H. B. et K.*

Rh. Crista-galli is a mixture of three species (and perhaps more).

While the Linnean generic term thus includes so many heterogeneous elements, it is difficult to understand why any systematist who appreciates the value of either clearness or scientific precision can defend the retention of the Linnean name."

In a note prefixed to the part of his *Prodromus* which contains the foregoing, Mr. Williams says: "British botanists, fearful of falling foul of the fences of the Vienna recommendations, have been loth to retain the generic name of *Alectorolophus*. But, as is rightly pointed out by Rouy in the last volume of his *Fl. de France* (just to hand) [xi. 126], the retention of *Rhinanthus* is contrary to Art. 45, which affirms that when, in the disintegration of a genus, one of the parts detached contains more species than any of the others, the name is reserved for that part which contains the greater number of species. Linnæus enumerates seven species of *Rhinanthus*. In the disintegration of *Rhinanthus*, the

genus *Rhynchocorys* claims a majority in species over any one of the other parts. If Art. 45 is to be observed, it is this genus therefore that is to take on the name of *Rhinanthus*, not *Alectorolophus*; that is, should it be deemed advisable to take up the name at all."

Mr. Williams may be quite right in his conclusion, but the arguments offered by him are not very convincing. Art. 45 of the Vienna Code of 1905 is not fully or fairly quoted. It runs:— "When a genus is divided into two or more genera, the name must be kept and given to one of the principal divisions. If the genus contains a section or some other division, which, judging by its name or its species, is the type or the origin of the group, the name is reserved for that part of it. If there is no such section or subdivision, but one of the parts detached contains *a great many* more species than the others, the name is reserved for that part of it." The words underlined in this notice, which are quite important for the argument in this case, are omitted by Mr. Williams. The corresponding part of the French text, recommended by the Commission of the Congress, was "*beaucoup plus*."

The following considerations are, however, pertinent to the question. *Alectorolophus* was published by Haller, first in his *Enum. Meth. Helvet.* ii. p. 623, in 1742; and subsequently in his *Hist. Stirp. Helvet.* i. p. 137, in 1768. The former work was earlier than the first edition of the *Species Plantarum* of Linnæus, and therefore, according to Art. 19 of the Vienna Code, is invalid for the purpose. The latter work of Haller is subsequent to both the first and second editions of the *Species Plantarum*, and therefore must be reckoned with; in it Haller adopted, from Pliny [Nat. Hist., book xxvii. chap. 5], the name *Alectorolophus*, and supplied a description which suits the plant *Rhinanthus Crista-galli* L.; he also gave, as a synonym, "Rhinanthus sp. Linn n. 740," and differentiated it from *Elephas*, that is, from *R. orientalis* L. and *R. Elephas* L. He described and named two species, namely, *A. glaber* All. with a variety (= *Rhinanthus Crista-galli* L., and var. β) and *A. hirsutus* All. (= *R. Crista-galli* L. var. γ). Each of these species Mr. Williams takes up; and his third species, *A. groenlandicus* Ostenfeld, may easily be supposed to be included in that comprehensive assemblage of forms, *Rhinanthus Crista-galli* L. It seems therefore that it may fairly be concluded that for British plants the name of *Rhinanthus* must be discarded, and its place taken by the genus *Alectorolophus*. This view was taken and acted on by Marschall v. Bieberstein in 1808, by Sprengel in 1825, by Sterneck in 1901, and now by Mr. Williams.

On the other hand, Bentham, in De Candolle, *Prodr. Nat. Regn. Veg.* x. p. 557 (8th April, 1846), used *Rhinanthus* L. as the genus to contain the yellow rattle, and quoted *Alectorolophus* as a synonym; he added: "Nomen Linnæi huic generi (nec Rhynchocorydi) servavi, nam character in gen. pl. omnino ad R. crista-galli redactus." In Engler & Prantl, *Nat. Pflazenfam.* iv. 3B, pp. 169, 171 (1893), R. v. Wettstein dealt with the matter in another way. He used *Rhinanthus* L. to contain the genera

Elephas Guss. and *Rhynchocorys* Griseb.; and he used *Fistularia* L. to receive *Rhinanthus Crista-galli* L., under the name of *F. Crista-galli* (L.) Wettst., as well as to receive other allied species. In the first edition of his *Systema Naturæ* (1735) Linnæus had *Rhinanthus*, with *Elephas* T. as a synonym; he also had *Fistularia*, with *Crista-galli* Riv. as a synonym. In his subsequent works Linnæus united *Rhinanthus*, *Elephas*, and *Crista-galli*, under the first name; and the name *Fistularia* was dropped. According to the Vienna International Code there is not any ground for reviving *Fistularia* for the name of a genus in preference to *Alectorolophus*. The ante-Linnean author, Dodoens, used *Fistularia* for *Pedicularis sylvatica* L.

SHORT NOTES.

Zannichellia gibberosa Reichb. as a British Plant.—While botanizing in the Fen ditches of Northamptonshire last September I noticed a very slender *Zannichellia* which differed considerably from the normal *Z. palustris* which is not unfrequent there, and which at that time was flowering freely. This slender plant was quite over flower, and indeed was decaying. Unfortunately the specimen I collected was lost on the journey to Oxford, and I had no lens with me. But I had noticed that the fruits were not conspicuously stalked, so could not refer it to *Z. maritima*, which at first sight I thought it to be. The plant, or rather the remembrance of it, rather fidgeted me, as I thought it required re-examination, so I again went to Peterborough the following week, when an examination of the fruit showed it to be good *gibberosa*, but the plant was too far gone to admit of good examples of the leaves being obtained. On this occasion I also collected a pondweed resembling *P. pusillus* in some respects, but with angled, not round, stems. This was only just coming into flower. Therefore the abnormally mild November tempted me to again visit the Fens, when, to my disappointment, the drain where the pondweed grew had been "cut," so that no further specimens were to be obtained. At this late date *Zannichellia palustris* was still in flower, but all traces of *Z. gibberosa* had disappeared. The latter plant was first described by Reichenbach in Moessler's *Handbook*, ed. 2, vol. iii. p. 1591, and is figured in Reichb. Icon. Bot. vol. viii. p. 24, t. dcclix. no. 1006, with the diagnosis, "Foliis tenuissimis, nuculis stipitatis divergentibus utrinque cristatis repando-dentatis." It is a much more slender and graceful plant than *palustris*, and my Eye specimens exactly match those from near Hamburg in the National Herbarium. The fruits, which are crested on both the dorsal and ventral surface, are practically identical with some kindly given me by Mr. Clement Reid from the Pakefield Forest Bed, near Cromer. These very ancient fruits have a few prominences on the sides as well; this, too, occurs rarely in the Eye plant. The semi-brackish ditches at Marcham, Berkshire, also afford *Z. gibberosa*, but as a somewhat

stouter form. I have not been able to meet with any other British examples in either the British Museum Herbarium or in our Oxford collection. The Berkshire specimen was collected in 1891.—G. Claridge Druce.

Plants of North Devon.—In 1908 the following additions to *Topographical Botany* were noticed near Exeter:—*Sisymbrium officinale* Scop. var. *leiocarpum* (Jord.), *Radicula palustris* Moench, *Epilobium roseum* Schreber, *Carduus acanthoides* L., *Lysimachia vulgaris* L., †*Mimulus guttatus* DC., *Mentha rubra* Sm., *Atriplex deltoidea* Bab., *Polygonum tomentosum* Schrank, †*P. cuspidatum* Sieb. & Zucc., †*Chenopodium opulifolium* Schrad., †*Populus serotina* Hartig (= *P. deltoidea* Marsh), †*Amaranthus retroflexus* L., †*Ambrosia artemisiifolia* L., *Butomus umbellatus* L., banks of the Exe, *Sparganium neglectum* Beeby, *Agrostis alba* L. var. *gigantea*, and *Festuca rubra* L. The new †*Sagittaria heterophylla* var. *iscana*, discovered by Mr. Hiern, is to be seen in large masses in the river, but I only noticed it below a paper mill (*Mimulus* also occurs). I am told by the Mayor of Exeter that American material (wood-pulp) has been used at the mill, and that American timber has been brought up the river. But the fact remains that, however the *Sagittaria* may have been introduced, it is now completely naturalized, and somewhat of a reflection is cast upon local botanists by its remaining so long unrecognized, since a great clump is close to the children's playground, and another within sight of the town-bridge over the Exe, although when out of flower the plant much resembles *Alisma Plantago-aquatica* L. [The sign † means that the plant is not native].—G. Claridge Druce.

Cornish Plants.—In 1908 I gathered an *Artemisia* at Par, which Dr. Britton, of New York, has kindly identified for me as *A. biennis* Willd. In botanical works the plant is described as without odour. This refers to the leaves only; the flowers have a strong and distinct smell. *Silene maritima* With. var. *parvifolia* Druce is by an error put in the *Flora of Cornwall* under *S. latifolia*. It occurs on shingle on Looe Bar. *Aster Tripolium* L. var. *discoideus* Reichb., Wadebridge.—G. Claridge Druce.

Abnormal Carex.—Last autumn Sir James Stirling sent me a stem of an abnormal *Carex* with the following note:—"In July, 1909, there were found near one spot in Finchcocks Wood, Goudhurst, Kent, six fruiting stems of *Carex lævigata* Smith, all of which were abnormal by reason of the terminal spike being androgynous. In one of these stems the terminal spike was male at the top; in the other five the terminal spike was male at the base. One of these five stems was growing side by side with a normal fruiting-stem, which appeared to spring from the same rootstock." Since sending me this note we have compared in the Boswell Herbarium a somewhat similar abnormal form of *Carex vulgaris*, which is recorded by Syme in *English Botany*, third edition, vol. x. p. 115. I consider the form to be sufficiently interesting to merit a permanent record.—Frederick J. Hanbury.

Ulota phyllantha Brid. in Fruit.—In view of the extreme rarity of fruiting examples of this moss occurring in the British Isles, it is perhaps worth while recording that Mr. H. Beesley, of Preston, found it bearing capsules abundantly in May, 1909, at Southpool, near Kingsbridge, in South Devon. He has sent me a tuft bearing sixteen capsules, and observed other plants carrying in all a total of about forty capsules.—J. A. Wheldon.

The late J. H. Davies (Journ. Bot. 1909, 451).— In the notice of the late John Henry Davies no mention is made of his residence in Yorkshire between the years 1850 and 1860. He was a member of the Thirsk Natural History Society, and worked at the mosses of Yorkshire. There is a paper of his in the *Phytologist* for 1859, p. 51, on the "Bryology of the Yorkshire Oolite," and on p. 55 it is stated that he acted as curator of the bryological department of the Thirsk Botanical Exchange Club.—C. H. Waddell.

Lincolnshire Plants.—During a visit to Skegness in August last I noticed a solitary group of *Silene maritima*. This plant is very scarce in Lincolnshire, previous records being Cleethorpes, 1837, and again in 1866. It was recorded from Skegness in 1891, and mine is apparently the fourth reported. There was a large clump of bloom past, present, and future, totalling about a hundred flowers. The station is on the sandhills near Ingoldmells. Close by in a salt marsh I noticed an abundant growth of *Carex extensa*. Mr. Woodruffe-Peacock (who has most kindly verified all my Lincolnshire specimens) tells me this is a new locality for this plant, it having been noticed previously in two other Watson divisions of the county. An interesting hybrid between *Verbascum Blattaria* and *V. Blattaria* × *nigrum* was noticed near the place, also *Leonurus cardiaca* in some plenty, and a brilliant mass of *Campanula rapunculoides*, spreading over some acres of ground. South of Skegness I noticed over a hundred plants of *Cochlearia danica* in an area of a square mile. This plant had not been recorded for Lincolnshire till I reported it last year.—Bernard Reynolds.

New Records in Scottish Bryophyta.—During a visit to Strathspey last autumn (1909) I was able to add a few new records in mosses and hepatics to vice-counties Elgin (95) and Easterness (96). Mosses: *Swartzia montana* Lindb. *c. fr.*, Sluggan Bridge, 96; *Ulota crispa* var. *crispula* Hamm. *c. fr.*, near Grantown-on-Spey and Dulnain Bridge, 95; *Orthotrichum rupestre* Schleich. *c. fr.*, near Kincardine Church, 96; *O. speciosum* Nees, *c. fr.*, near Dulnain Bridge, 95; *Bryum concinnatum* Spruce, Ben More, 95; *Eurhynchium myosuroides* var. *brachythecioides* Dixon, near Grantown-on-Spey, 95; *Hypnum exannulatum* var. *pinnatum* forma *gracile*, Ben More, 95; *H. sarmentosum* Wahl., Ben More, 95. Hepatics: *Aneura latifrons* Lindb., 95; *Mylia anomala* (Hook.) Gray, 95; *Ptilidium ciliare* (L.) Hampe, 95; *Scapania gracilis* (Lindb.) Kaal., 95; all on Ben More. An interesting find was a

specimen of *Ulota phyllantha* Brid. near Dulnain Bridge, 95, bearing four capsules. I believe this species fruits very rarely, and do not know of any Scottish record. I also found a moss new to Ayr (75), *Hedwigia imberbis* Spruce, on Knockdolian Hills.—ELEONORA ARMITAGE.

FUMARIA OCCIDENTALIS.—With reference to the note appearing on p. 447 of this Journal for December last, suggesting that Dr. C. C. Vigurs should be credited with the discovery of this *Fumaria*, it may be well to state that Dr. Vigurs's name does not appear in my paper of 1904 for the very good reason that it was not until after the plant was worked out and the paper written that I heard anything of his claims or received any specimens from him. Mr. Clarke has now expressed regret that his note was written without adequate information. As persistent attempts have been made to associate Dr. Vigurs's name with this fumitory (see Journ. Bot. 1908, p. 57), I would add that he was in no way connected with my discovery of the plant and its publication as a new species. The description and figure were taken from my original specimens gathered at Penzance and Helston in 1902; and the absurdity of any claim based on the ground of recognising the plant before that year as an unknown British form is at once apparent when it is remembered that this implies an ability to distinguish the forms already described—which was clearly impossible for a provincial botanist prior to my revision of these plants in this Journal for 1902. Moreover, for some years subsequent to 1904, Dr. Vigurs's naming of *Fumariæ* was not always what I could endorse; and the fact that the plant prevalent at Newquay proved to be the new species can only be regarded, I think, as a coincidence such as has probably occurred with most botanists of experience, and, curiously enough, happened in my own case with *Euphrasia Vigursii*, which I collected as an unusual form in 1905 and attempted, without success, to get a name for.—H. W. PUGSLEY.

BOTANICAL EXCHANGE CLUBS. — In this Journal for 1909 (p. 432) Mr. A. B. Jackson suggests that the objection I raised to the proposed amalgamation of the two Botanical Exchange Clubs—that it would entail too much work on the part of the distributor—can hardly be maintained, "because the chief contributing members are common to both Clubs, and usually send the same plants to each." I am now in a position to show that in this statement Mr. Jackson is entirely wrong. The Botanical Exchange Club of the British Isles has sixty-one members and the Watson Botanical Exchange Club fifty-six. Of these twenty-two belong to both Clubs. Through the kindness of Mr. Druce I have been able to examine the book in which the lists of plants sent to the B.E.C. are entered, and, comparing those lists with ours for the only years for which we have kept a record, I find that in 1906 the members who belong to both Clubs sent two hundred species and varieties to the Watson Club and one hundred and fifty to the B.E.C., but in only thirty-seven cases they sent the same plant to both Clubs. In 1908 those members sent one hundred and seventy-five species

and varieties to the Watson Club and one hundred and forty-one to the B.E.C., only twenty-eight being sent to both. I find moreover that the plants sent in duplicate to the two Clubs formed in 1906 only one-fifteenth of the total contributions, and in 1908 less than one-thirteenth. It is thus proved conclusively that there would be little saving of labour by amalgamation, and the work of distribution would be quite beyond the power of any one man. Such a combined Club would, in fact, be completely unmanageable by voluntary work unless the numbers were greatly reduced. In addition, it may be stated that the Watson Club gives greater encouragement to botanists who are not so advanced, but who, we hope, may be helped to become the critical botanists of the future. During the last few weeks I have received many expressions of strong disapproval of the proposed amalgamation from the most active members, some of whom belong to both Clubs and some only to the Watson, and it is particularly noticeable that no member has written in favour of it.—GEORGE GOODE, *Hon. Sec. Watson Botanical Exchange Club.*

REVIEWS.

Flora descriptiva é illustrada de Galicia. Por el R. P. BALTASAR MERINO, S.J. Three volumes, 8vo. Santiago. Vol. i., 1905, pp. lxxii., 621; vol. ii., 1906, pp. 636; vol. iii., 1909, pp. 695. Prices 9, 9, and 10 pesetas, respectively.

SPANISH Galicia has now got a thoroughly useful, satisfactory and, indeed, a handsome work on its flowering plants and higher cryptogams. The area contains about 2,935,556 hectares, that is, rather more than half as much again as does Wales; it is a province in the north-west angle of Spain, lying between 40° 51′ and 43° 47′ N. lat., and between 6° 50′ and 9° 16′ W. long.; its greatest length is about 201 kilometers, and its greatest breadth about 185 kilometers. It is traversed from east to west by a continuation of the great Pyrenean and Cantabrian chain of mountains, the greatest altitude being rather above 2000 meters. The climate of the coast is mild and comparatively equable, but the interior, owing to the high elevation, has a wide range of temperature. The rainfall is exceptionally large, and snow lies on some of the higher mountains during a large portion of the year. The soil is on the whole fertile, and the produce very varied; the mineral resources also are considerable, and to some extent were known to the ancients. The flora therefore may be expected to prove interesting and fairly rich in its constitution.

In this book, with the exception of the new species and other novelties, the descriptions are entirely in Spanish, as well as the rest of the information. Using with permission and acknowledgment the woodcuts drawn by A. Jobin and included in H. Coste's *Flore descriptive et illustrée de France*, Father Merino has prefixed a vocabulary of technical terms illustrated with the 453 figures. Then follows an article on the determination of the

families of plants, together with a dichotomous key. In connection with the descriptions of the families, genera, species, &c., dichotomous keys are likewise supplied under each family for the determination of the genera, and under each genus for the determination of the species; also in the detailed descriptions of the species, the more diagnostic points of character are indicated by means of italic type. At least one species in nearly every genus is illustrated with a figure; there are 596 such figures.

The number of families dealt with is 129, of genera 617, and of species (including some subspecies and hybrids) 1855. In most instances a specimen in the herbarium is quoted by number; in the case of a new species such definite fixity is calculated to prove especially important for future reference.

The total number of dicotyledons included in the flora is 1400, and that of monocotyledons is 406; the proportion of these numbers is nearly as 3·45 to 1. In Bubani's *Flora Pyrenæa* (1897–1901) the corresponding proportion was nearly as 3·88 to 1. A comparison of these figures suggests the conclusion that in general the climate of Galicia is colder than that of the area covered by Bubani's *Flora*.

The sequence of the families is mainly that of De Candolle. The ten families containing the largest number of species, &c., are in descending order:—*Compositæ* 202, *Graminæ* 189, *Leguminosæ* 128, *Cruciferæ* 81, *Umbelliferæ* 77, *Scrophulariaceæ* 71, *Rosaceæ* 59, *Cyperaceæ* 59, *Ranunculaceæ* 53, and *Labiatæ* 52.

No new genus is described, but there are, with descriptions in Latin, twenty-seven new species, besides fourteen new hybrids. **The new species are as follows:—**

Vol. i. p. 38. *Ranunculus acutilobus* Merino [not of Ledeb.].
„ „ 59. *Anemone Francoana* Merino.
„ „ 84. *Asterocarpus latifolius* Merino.
„ „ 177. *Tuberaria Galæcica* Pau et Merino (*T. inconspicua* Willkomm var. *Galæcica* Contr. à la Fl. de Gal. Suppl. i. p. 40).
„ „ 227. *Sagina Rosoni* Merino.
„ „ 228. *S. Merinoi* Pau.
„ „ 540. *Saxifraga Paui* Merino (*S. Clusii* × *stellaris* Pau *in litt.*).
„ „ 586. *Œnanthe Galæcica* Pau et Merino [and ex Merino, in Mem. Soc. Esp. Hist. Nat. ii. 493].
„ „ 600. *Conopodium Paui* Merino.

Vol. ii. p. 88. *Scrophularia oblongifolia* Merino (c. fig.) [not of Loisel.].
„ „ 90. *S. Paui* Merino (c. fig.).
„ „ 111. *Veronica minniana* Merino [cf. *V. miniana* Merino, Contrib. Fl. Galic. 116].
„ „ 113. *V. Reyesana* Pau et Merino.
„ „ 158. *Echium vulnerans* Merino [and in Bol. Soc. Arag. iii. 189].
„ „ 286. *Galium teres* Merino.

Vol. ii. p. 452. *Leontodon farinosus* Merino et Pau (*L. græcus* Boissier Heldr. Contr. à la Fl. de Gal. Suppl. iv. p. 26).
" " 555. *Rumex Planellæ* Pau et Merino (*R. Acetosa* Planellas, probabiliter, Ensago, p. 347).
Vol. iii. p. 179. *Carex fuscotincta* Merino [and in Mem. Soc. Esp. Hist. Nat. ii. 467].
" " 186. *C. Rodriguezii* Merino.
" " 403. *Desmazeria pauciflora* Merino (*D. Castellana*? Willkomm).
" " 508. (Subspecies) *Fumaria Merinoi* Pau.
" " 545. *Rosa multiflora* Merino [not of Thunberg, &c.].
" " 550. *R. ancarensis* Pau et Merino.
" " 561. *Sedum cineritium* Merino (*S. brevifolium* DC. var. *cineritium* Merino, Flora i. p. 529).
" " 593. *Jasione ambigua* Merino.
" " 611. *Hieracium Merinoi* Pau.
" " 615. *Narcissus Lagoi* Merino.

One species of *Lysimachia*, named and described as a new species in the second volume, has in the third volume been reduced to become a form of *L. vulgaris* L.

The printing of the work was finished in the *Tipografia Galaica* at Santiago, on September 18, 1909.

W. P. HIERN.

Hayward's Botanist's Pocket-Book. Thirteenth edition revised and enlarged by G. CLARIDGE DRUCE, M.A., F.L.S. Pott 8vo, cl. pp. xliv. 280. Price 4*s.* 6*d.* Bell & Sons.

THIS new edition of what has long been recognised as a handy and useful little volume differs in many respects from preceding issues, to many of which the term "edition" was incorrectly applied. It is far more comprehensive, for whereas the original compiler was chary in admitting varieties, including only those to be found in our floras, Mr. Druce has entered these with a liberal hand; thus, to take one genus—*Viola*—as an illustration, where Hayward was content with 22 names of various ranks and values Mr. Druce gives us 37, exclusive of "a large number of varieties of *V. tricolor*," of which, at the time when he wrote, no accurate descriptions had been made. In *Rhinanthus*, Hayward had two species; Mr. Druce enriches one of these with three varieties and the other with five—all of "Druce," as some were originally described under *Alectorolophus*.

Whether this extension will be for the advantage of the field botanist, only experience can show. We confess to some doubt on the subject—doubt, that is, as to whether these varieties are so clearly defined and so readily distinguished as to be separable by a diagnostic phrase or a line or two of description. A large proportion of them are not found in any of our floras, and it seems to us that many are—to adapt a phrase from the Articles of Religion—either "states of life allowed" by the description of the species in

a reasonably wide sense, or "have no warranty" that they have been sufficiently compared with the types on which they are supposed to be based. Instances of both of these have from time to time been brought forward in these pages, and we have a strong conviction that a careful comparison with types would eliminate a considerable number of the names which now figure in some of our lists, just as such varieties as *Spiræa Ulmaria* var. *denudata*, the narrow-leaved form of *Heracleum Sphondylium* or the dissected-leaved forms of *Pimpinella*, distinct as they may appear, can hardly be regarded as being more than extreme states of the species. It is much to be desired that some one with leisure and capability should go critically through the "varieties" which now find their way into our lists, and furnish us with reasons "why some should be abolished and others retained."

We are not sure whether all the varieties included in this new edition of the *Pocket-Book* have been actually so recorded as British in periodical or other literature; from their nature they are not always easy to trace in print, and Mr. Druce, for whom no task seems too onerous, would do a useful thing if he would publish a list of them, with references to their places of publication. We note, however, that those given in the *Pocket-Book* by no means correspond with those in Mr. Druce's *List of British Plants*: in the latter, for example, *Limonium* has 6 species and 5 varieties—here it has 5 species and 3 varieties, one of the latter being *L. recurvum* C. E. Salmon, which Mr. Druce here reduces. We believe that Mr. Druce has nowhere published an account of his reasons for dissenting from the conclusions at which Mr. Salmon arrived (see Journ. Bot. 1903, 67) after a very careful study of this plant and its affinities; and it seems hardly right by a stroke of the pen to effect such a reduction, which, if accepted, will of course imply the acceptance of Mr. Druce as the authority for the variety. Under *Statice* Mr. Druce's *List* has 3 species and 6 varieties; here we have 2 species and 3 varieties, and one of these, which stood as *bractescens* Druce in 1908, now becomes *bracteata* Druce. Discrepancies of this kind are not calculated to help the student.

We note that Mr. Druce wisely refrains from any attempt to deal with the critical genera *Rubus*, *Hieracium*, and *Euphrasia*, and we think *Rosa* might have been added to the list. He has exercised a wise discretion as to the inclusion of aliens, only those having some claim to being established, or are at least frequently met with, being given; *Kentranthus Calcitrapa* might we think have been omitted, as it has disappeared from Eltham, and *Cotoneaster microphylla*, which seems to be becoming permanent, might have been added.

With regard to nomenclature, Mr. Druce, although "not in complete agreement" with them, follows the Vienna Rules; in this we think he is wise, and by so doing he adds one more to the list of works which, as was pointed out in our last issue, furnish an argument against any alteration of the "nomina conservanda." We note, however, that the trivial names do not in every case

correspond with those in his *List*, and the return to *Silene inflata* Sm. (for *S. latifolia* of the three recent Catalogues) will delight those who object to the disturbance of names long in use. We regret that the opportunity was not taken to devote to more useful purposes the space occupied by the "common names"; these, however, formed part of the original plan of the book, and Mr. Druce has not added to the absurdities thereby involved by manufacturing such names for the varieties.

As we began by saying, the *Botanist's Pocket-Book* has stood the test of experience; in its new form it cannot fail to extend its usefulness, which would we think be further increased if, in its next issue, Mr. Druce would add a brief bibliography, containing the names of the principal British and local floras.

Bref och skrifvelser af och till Carl von Linné, med understöd af Svenska Staten, utgifna af Upsala Universitet. Första afdelningen. Del iii. Bref till och från Svenska enskilda personer: A–B, utom Bäck. Utgifna och med upplysande noter försedda af Th. M. Fries. Stockholm: Aktiebolaget Ljus 1909. 8vo, pp. ii. × 342.

The first two volumes of this important work were noticed in this Journal for May last (pp. 190, 191). Since then the plan has been modified by compressing the four proposed sections into two, which may be stated as—Sect. I. Letters to and from Swedes, and Sect. II. Letters to and from persons of other nationalities. This volume now begins the series of private correspondence, by which is meant non-official; the previous volumes having taken account of the many letters written to persons connected with the Swedish Government, or to the secretaries of the Swedish Academy of Science.

Many of the letters in the volume now before us are from the large collection of Linnean letters in the possession of the Linnean Society of London, which are bound in alphabetical order of authors' names, and still more will follow when the second section is entered upon. That, however, must be for long a distant prospect, as the volume now under review takes in only the letters A and B, excepting, and it is a large exception, those of Linné's close and intimate friend, Archiater Bäck. We understand that Bäck's letters will well-nigh fill the next volume.

There are many most interesting details to be learned from these newly issued letters. In many cases the exchange of letters is between old pupils and their former teacher, or from others journeying in other countries and sending news home. To us in Britain we find delightful little sidelights on eighteenth-century matters; Banks and Solander are frequently mentioned, Miller and Lee of Hammersmith scarcely less so. Andreas Berlin, Pehr Bjerchén, and J. J. Björnståhl, the Orientalist, were correspondents communicating these English news, and the last relates how he visited Hartecamp, and found the gardens practically in the same state as when Linné had charge of them. Clifford's son was then

Burgomaster of Amsterdam, but the picture of Linné in his Lapland costume was no longer at Hartecamp. By help of the two Burmans it was traced to the possession of the purchaser, Du Feirou van Limmen, and when a sight was obtained it was thought to show but little likeness to the original, which was ascribed to the time since it was painted, a period of nearly forty years.

Prof. T. M. Fries continues his invaluable series of explanatory notes, such as probably no one but himself could supply, and he makes a very graceful and hearty acknowledgement of the facilities granted by the Linnean Society towards the prosecution of his work.

B. D. J.

BOOK-NOTES, NEWS, &c.

British botany has suffered a loss by the death of Mr. William Haddon Beeby, F.L.S. Mr. Beeby died suddenly after a short illness on January 4, at his home at Thames Ditton; he was sixty years of age. Some account of Mr. Beeby's life and work will appear in an early number.

We have also to announce the death of Dr. Peter MacOwan, formerly Government Botanist of Cape Colony, who died on December 1, 1909. Dr. MacOwan's name is well known to workers at South African botany, in connection with which he made valuable collections; together with Dr. Harry Bolus he issued a series of plants under the title, "Herbarium Austro-Africanum."

Mr. R. H. Bunting, who has been since 1898 an attendant in the Department of Botany, British Museum, has been appointed botanical collector to the Liberian Company, with which Sir Harry Johnston is associated. Mr. Bunting's work will be to assist in a botanical survey of Liberia.

Botanists, and especially bryologists, will hear with regret of the death of Mr. George Holmes, of Stroud, Gloucestershire, who died on October 17th, aged seventy-five. He had devoted himself for very many years to the study of mosses, principally in Gloucestershire. He was a painstaking and enthusiastic worker, and a remarkably good judge of critical species and varieties. The additions he made to the recorded flora of the county are too numerous to mention here, but his discovery of *Eurhynchium rotundifolium*, in what is, moreover, its only known British station, deserves special notice. His interest in Natural History of all kinds was wide, and he was a genial friend and companion both in and out of the field. His valuable herbarium was presented by him a few years ago to the Stroud Literary Institute.

We regret that through a printer's error the name of Mr. Herbert F. Wernham, who has recently been appointed an Assistant in the Department of Botany, British Museum, was given in our last issue as Herbert P. Wenham.

LEITZ' NEW MICROSCOPES

possess many advantages over the older type, and embody several important features not **to be found in any others.**

The modified horseshoe base gives **greater rigidity,** and the larger stage and curved limb **additional working space,** allowing large size Petri dishes, etc., to be examined with convenience. The new fine adjustment, with an endless motion, is **stronger and more durable** than the micrometer screw adjustment, and in the hands of the novice renders **breakage of cover glasses and injury to the front lenses of objectives impossible.** It enables the expert worker to attain **greater speed in focussing,** especially with oil immersion objectives.

The mechanical features in the new models, combined with the high quality of the recently improved objectives, place the Leitz Microscopes in an

UNRIVALLED POSITION.

Prices, with Optical Equipment, from £6 10s. upwards.

LEITZ' APLANATIC LENSES

are remarkable for their Large Flat Field, Excellent Definition, and Freedom from Chromatic Aberration.

In Nickel-plated Folders (as figured) from × 8 to × 40, price **12 -** each.
In Mounts to fit Dissecting Microscopes .. .. .. **10 -** ,,

The instruments and lenses may be examined in the showrooms of reputable dealers, or at the firm's London Branch, where demonstrations of latest inventions are frequently given.

DESCRIPTIVE CATALOGUE FREE ON REQUEST.

E. LEITZ, **OXFORD HOUSE, 9, OXFORD ST., LONDON, W.**

Telephone : Gerrard 1674. Agents in all University Centres.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of November and December (Double Number).—Recent Advances in the Study of Heredity. Lecture V.—The 1 : 2 : 1 and 3 : 9 : 4 Ratios. Lecture VI.—The Mendelian Inheritance of Sexual Characters, by A. D. Darbishire. Observations on Phycoerythrin, the Red Pigment of Deep-water Algæ (Plate V.), by E. K. Hanson. The Embryo-sac and Embryo of *Geissoloma marginata* (Plate VI.), by E. L. Stephens. Notes on *Polyporus squamosus* Huds. (Text-fig. 44), by F. T. Brooks. Hybrids between *Galium verum* and *G. mollugo* (Text-fig. 45), by Eleonora Armitage. *Botrychium lunaria* with two Fertile Lobes (Text-fig. 46), by M. Benson. Vegetation and Frost, by F. F. Blackman. The British Association at Winnipeg, by R. H. Y. Review: German Vegetation, by A. G. T. Notes on Recent Literature: Recent Progress in the Study of the Embryo-sac of the Angiosperms, by E. L. Stephens. British Local Floras, by C. E. M. Fungi, by F. T. B.

Subscription-Price. 15*s. per annum (ten numbers) post free.*
Price of single number, 2*s.* *Price of double number,* 4*s.*

Published Monthly by the Editor, The Botany School, Cambridge.

Society for Promoting Christian Knowledge.

BRITISH WILD FLOWERS IN THEIR NATURAL COLOURS AND FORM. Text by Professor HENSLOW. With over 200 Coloured Illustrations. The Artist, GRACE LAYTON, obtained the Silver Flora Medal from the Horticultural Society for these drawings. Large crown 8vo, cloth boards, **8s.** [*The special merit of these Illustrations is their being true to nature in colour, and as near as possible in size.*]

FLOWERS OF THE FIELD. By the late Rev. C. A. JOHNS, B.A., F.L.S. 31st edition, revised by G. S. BOULGER, F.L.S., F.G.S., Professor of Botany in the City of London College. New Edition, with **64 Coloured Plates.** The Artist, Grace Layton, obtained the Silver Flora Medal of the Royal Horticultural Society for these drawings. Small post 8vo, cloth boards, **7s. 6d.**

[***This improved Edition is the cheapest and best.***]

GRASSES. By C. H. JOHNS, M.A. Post 8vo, with numerous woodcuts, cloth boards. **1s. 6d.**

THE FERN PORTFOLIO, By FRANCIS GEORGE HEATH. With fifteen plates, elaborately drawn, life-size, exquisitely coloured from Nature, and accompanied by descriptive text; **all the species of British Ferns,** which comprise a large proportion of the **Ferns of America, and many other parts of the World;** elegantly bound in cloth. **6s.**

WHERE TO FIND FERNS. By FRANCIS G. HEATH. With numerous Illustrations, Fcap. 8vo, cloth boards. **1s.**

WILD FLOWERS. By ANNE PRATT, Author of 'Our Native Songsters,' &c. 16mo, with 192 coloured plates, in two volumes. **8s.**

FREAKS AND MARVELS OF PLANT LIFE; or, CURIOSITIES OF VEGETATION. By M. C. COOKE, M.A. Post 8vo, with numerous illustrations, cloth boards. **4s.**

THE FOREST TREES OF BRITAIN. By the late Rev. C. A. JOHNS, B.A., F.L.S. Post 8vo, with 150 woodcuts, cloth boards, **5s.**; half calf, extra, gilt edges, **10s.**

DISEASES OF PLANTS. By Professor MARSHALL WARD. With numerous illustrations. Post 8vo, cloth boards. **2s. 6d.**

LONDON: NORTHUMBERLAND AVENUE, W.C.; 43, QUEEN VICTORIA ST., E.C.
BRIGHTON: 129, NORTH STREET.

Journal of Botany Reprints.

BOUND SEPARATELY IN PAPER COVER. PRICE 1S. 6D. POSTAGE 1D.

THIRD SUPPLEMENT
TO THE
BIOGRAPHICAL INDEX OF BRITISH & IRISH BOTANISTS.

254 PP., DEMY 8VO, CLOTH EXTRA, PRICE 9S. 6D. NET.

BIOGRAPHICAL INDEX
OF
DECEASED BRITISH & IRISH BOTANISTS.

BY
JAMES BRITTEN, K.S.G., F.L.S., & G. S. BOULGER, F.L.S.
BOUND UP TOGETHER WITH
FIRST (1893–97) & SECOND (1898–1902) SUPPLEMENTS.

The SUPPLEMENTS can also be had separately, price 1/6 each; postage 1d.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

Subscriptions to the Journal of Botany (16s. post free) for 1910 should now be sent to West, Newman & Co.

No. 567 MARCH, 1910 Vol. XLVIII

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

	PAGE
Notes on British Elms. By the Rev. Augustin Ley, M.A. (Plate 503)	65
Two New Mycetozoa. E. G. Lister, F.L.S.	73
Notes on the Flora of Flintshire. By A. A. Dallman, F.C.S. (continued)	73
Short Notes.—*Zannichellia gibberosa* Reichb.—*Rhinanthus* versus *Alectorolophus*—"Hayward's Botanist's Pocket Book"—*Daphne Laureola* × *Mezereum* in N. Somerset—Plants of N. Devon—The late J. H. Davies—*Lathræa clandestina* L.—*Agrostis verticillata* Vill. in Cornwall—*Viola hirta* × *sylvestris* in Herefordshire—Abnormal *Carex*	77
Reviews:—	
Cronologia della Flora Italiana. ossia Repertorio sistematico delle più antiche date ed autori del rinvenimento delle piante (Fanerogame e Pteridofite) indigene, naturalizzate e avventizie d'Italia e della introduzione di quelle esotiche più comunemente coltivate fra noi di P. A. Saccardo	80
Vorträge uber Botanische Stammesgeschichte. Von. J. P. Lotsy	82
Some Popular Books	84
Obituary	88
Supplement.—The British Roses. By Major A. H. Wolley-Dod (continued).	

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had price 1s. 6d. each.

AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

2 pages	25 copies	4s.	4 pages	25 copies	5s.	8 pages	25 copies	8s. 0d.
,,	50 ,,	5s.	,,	50 ,,	6s.	,,	50 ,,	9s. 0d.
,,	100 ,,	7s.	,,	100 ,,	8s.	,,	100 ,,	10s. 6d.

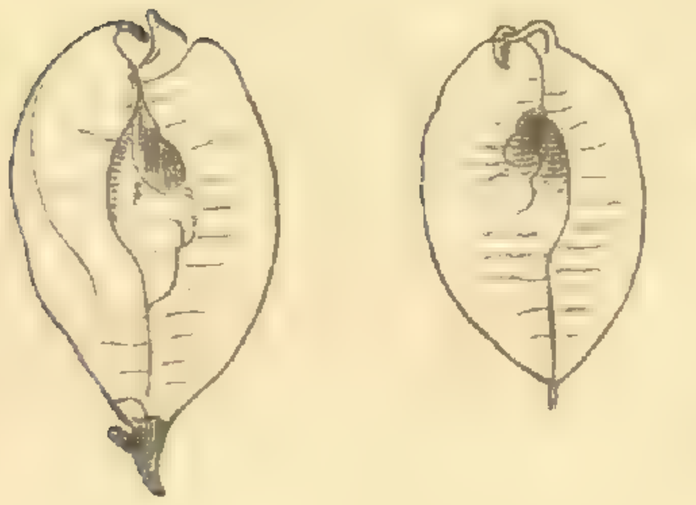
A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

Ulmus scabra *Miller.*

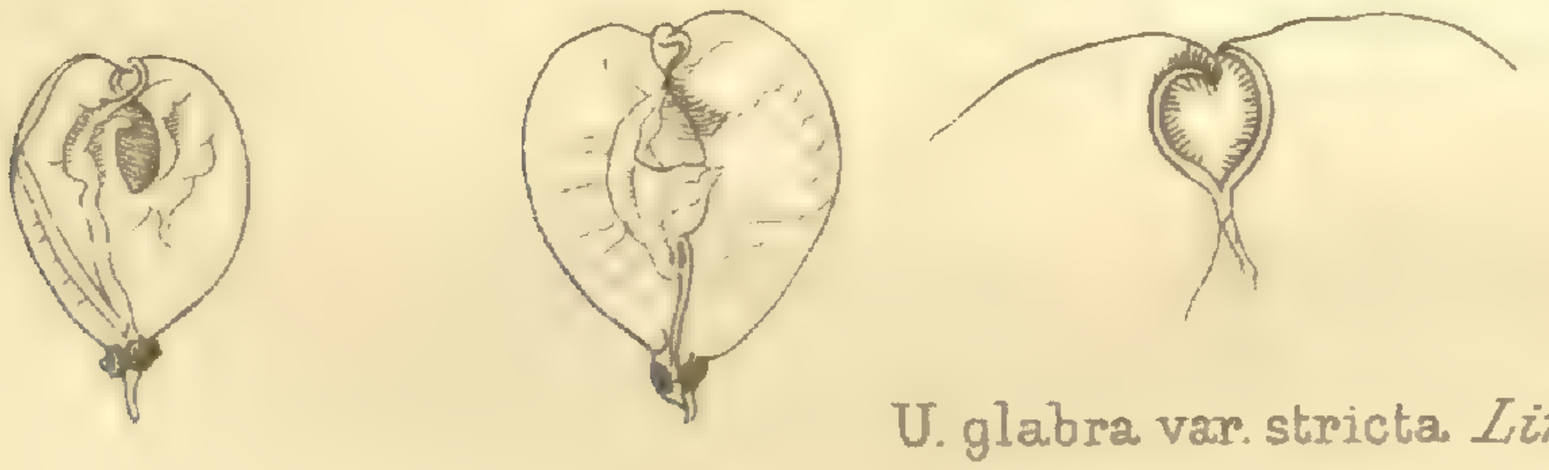
U. scabra var nitida



U. vegeta *Loudon.*

U. vegeta *Loudon.*

U. glabra *Miller.*



U. glabra var. stricta *Lindley.*

U. major *Smith.*

U. surculosa *Stokes.*

E.W.Hunnybun del.

West, Newman lith.

British Elms.

NOTES ON BRITISH ELMS.

By the Rev. Augustin Ley, M.A.

(Plate 503.)

With the exception of Mr. Boulger's admirable essay, published in the *Scottish Naturalist* in 1879, little seems to have been published on this subject since the time of the great writers of the beginning of the nineteenth century—Loudon, Lindley, and Sir J. E. Smith, preceded by Stokes, Withering, Miller, and Hudson.

It ought not to be impossible to disentangle the confusion into which the nomenclature of these trees has fallen, considering the paucity of the forms found spontaneous in Britain, and the ease with which, when studied in Nature, they lend themselves to discrimination. The difficulties of the nomenclature arise chiefly from the inadequacy of early descriptions, joined with the absence or inadequacy of type specimens.

Nothing more is attempted in the present brief paper than to furnish a framework, which other observers may fill in, and the accuracy or otherwise of which can be tested in the field.

It is my conviction that the mature samara affords the best available distinction of species. If so, as one of the essential reproductive organs of the tree, it must be accorded the first place in diagnosis; and although this has the disadvantage of making a double set of observations necessary, in spring and summer, yet with a little trouble it is nearly always possible to obtain complete specimens. It will be found that the characters derived from the samara are correlated with other characters, less essential but more noticeable, derived from the habit and vegetative system of the tree.

The samara consists of a flattened wing surrounding a central cavity, in which the seed is placed. It varies in shape, being oval, elliptic, obovate, or nearly orbicular, and in size from an inch or more in *Ulmus scabra* to about a third to half an inch in *U. surculosa*. It is furnished with a notch at the top, this notch being at times large and open; more often its entrance is closed by the incurvation of the tips. When this incurvation is more pronounced the sides overlap, and the notch becomes entirely closed. Internally it is ciliate with the short coarse stigmatic hairs, and its lower extremity terminates in an angle or curve, which varies regularly in the different species, and affords a useful diagnostic character.

Next to the samara, the habit of propagation by suckers, so largely made use of by the trees of this genus, stands in the order of importance. This has a direct relation to the perfecting of the seeds, of such sort that where the propagation by suckers is absent the seeds are uniformly fertile; where that reaches its maximum the seeds are abortive. The species are thus headed at one end by *U. scabra*, in which the suckers are 0 and the seeds uniformly fertile; at the other by *U. surculosa*, in which the

suckers are very numerous and the seeds abortive; the other species standing in these respects between these two extremes in the order adopted in this paper. It will follow from this that the infertility of the seeds in *U. surculosa*, which has often been used as an argument that this species is non-native in Britain, is seen to have a more natural explanation, if it may be assumed that the tree has given up maturing its seeds on account of the successful output of its suckers. The recent discovery, kindly communicated to me by Messrs. Elwes and Druce, that this species is apparently endemic to Britain, may also well be correlated with the non-perfecting of the seed. The effort required for ripening the seed was realized in 1909 through the fact that many individuals of *U. scabra*, and to a less extent of *U. vegeta* and *U. glabra*, were rendered leafless, and almost if not quite killed, by the effort required to ripen a very unusual crop of seed, while *U. surculosa* did not suffer at all. In accordance with this stands also the fact that *U. scabra* begins to fruit very early in its life, and fruits on all its twigs, while *U. surculosa* does not begin to fruit until the tree is about forty years old, and then fruits in a usual way only on its outermost or highest branches. It is natural to anticipate that, after a certain period of development, this tree will give up producing its samaras altogether.

Habit is of great importance in this genus. Being unrecognizable in the herbarium, this should be carefully noted in the field, and recorded on herbarium labels. Fortunately it admits of pretty accurate definition in descriptions, and it is so well defined in nature that all the species can probably be recognized in winter from their habit alone. The chief varieties of habit are as follows :—

1. Smooth, variously curved bole, long spreading, at length drooping limbs, rather slender twigs . . . . *scabra.*
2. Smooth straight bole, long ascending limbs, less slender twigs . . . . . *vegeta.*
3. Smooth slender bole, tall or low, ascending, drooping or straight limbs, long, very slender, much divided twigs . . . . . *glabra.*
4. Rough bole, branching low down, spreading, at length drooping, pointed limbs, thick, little divided twigs *major.*
5. Rough, straight and tall bole, spreading stiff limbs, much divided stiff twigs, rounded masses of foliage *surculosa.*

The leaves of each species show a considerable uniformity of size and shape on the tree itself, and in well-grown examples; in very dry situations, or under the dense shade of hedges or woods, the leaves become much smaller, and are sometimes modified considerably in shape. The leaves of the suckers, however (where this modification especially takes place), never exhibit any such marked difference of shape or clothing, as compared with those of the tree, as is so often the case in the poplars. The size as well as the shape of the leaves is of considerable importance as a specific character, except perhaps in *U. glabra*, which, as a much more

aggregate species than the others, varies more than do the rest in leaf characters. The roughness or smoothness of their surfaces, as well as the amount and disposition of the hair clothing them, is also in many cases a useful guide; it is, however, seldom an absolute character in the aggregate *U. glabra*.

In collecting specimens for the herbarium care should be taken to gather normal leaves from the branches of the tree itself, not from cropped parts nor from suckers. When specimens are taken from suckers this should be plainly stated, otherwise they are misleading.

I have to acknowledge help from Dr. C. E. Moss, Curator of the University Museum, Cambridge; from Mr. Clement Reid, F.R.S.; and especially from Mr. E. G. Baker, F.L.S., of the Botanical Department of the British Museum (Natural History). Without the literature and collections existing in the Botanical Department of the Natural History Museum the task of unravelling the synonymy would have been difficult.

Synopsis of Characters.

1	Seed cavity at centre of samara, suckers 0	2
	Seed cavity above centre, suckers present	3
2	Samara large (1 in.), oval or elliptic; notch not reaching more than quarter distance to cavity, its basal angle very acute	1. *scabra*.
3	Samara large, broadly oval or obovate obtuse; notch reaching half distance to cavity, its basal angle acute	2. *vegeta*.
	Samara rather smaller, obovate; notch reaching nearly to cavity, its basal angle rather obtuse	4
	Samara small (½ in.), nearly orbicular; notch evenly curved at base, suckers very numerous	5. *surculosa*.
4	Bole and twigs smooth, leaves ovate- or obovate-lanceolate, light green	3. *glabra*.
	Suckers and twigs especially those arising from bole suberous	5
5	Leaves rather narrow, acuminate, branches straight, slender	3. *glabra* var. *suberosa*.
	Leaves broadly ovate, branches pointed, drooping	4. *major*.

1. Ulmus scabra (*scabris*) Mill. Gard. Dict. ed. 8, n. 2 (1768).
   U. hollandica (*hollandicus*) Mill. *l.c.* n. 5.
   U. montana Stokes in With. Bot. Arr. ed. 2, i. 259 (1787).
   U. campestris L. Sp. Pl. 225 pro parte et herb. ? (1753).
   U. glabra Huds. Fl. Angl. 95 pro parte (1762).

Wych Elm.

"*U.* (*scabris*) foliis oblongo-ovatis inæqualiter serratis, calycibus foliaceis.' Miller *l. c.*

"*U.* (*Hollandicus*) foliis ovatis acuminatis rugosis, inæqualiter serratis, cortice fungoso. . . . Ulmus major Hollandica, angustis et magis acuminatis samarris, folio latissimo, scabro. Pluk. Alm. [393]." Miller *l. c.*

Specimens from Plukenet are in Hb. Sloane 98, f. 168, and 102, f. 131.

Samara large, narrowly or broadly oblong or obovate, somewhat pointed, 1 in.; notch open or closed, when open its basal

angle very acute, hardly reaching quarter way to seed cavity, which is placed at the centre of the samara.

Leaves obovate acuminate, deep green, epilose and scabrous above, hairy on midrib and secondary veins beneath, the hairs often glandular when young, with clustered hair at the axils of the veins, as in all the species; buds, petioles, and young twigs hairy. Bark light coloured, smooth; twigs never suberous. Suckers absent. Leaves often micro-glandular beneath. Height 50 to 60 ft.; bole seldom conspicuous; branches long, at length drooping. Varying greatly in the breadth and size of the leaves; these often present two to five false points in addition to the main point, especially on the lower branches of the tree, or on vigorous shoots where a stump has been cut—an arrangement not found in any of our other species. Flowers and fertile seeds are produced on quite young trees, and on every part of them.

Native and abundant throughout Britain, especially in the hilly parts.

Many named varieties of the Wych Elm are cultivated in botanical gardens, but I have failed to learn their distinctive characters.

Var. *nitida* Syme, Eng. Bot. ed. 3, viii. 142 (1868).

"Leaves shining and glabrous above. Branches without corky excrescences. Has all the essential characters of *U. montana*."

Samara rounder at the point than in the type; notch distinct, its basal angle acute, reaching more than one-fifth way to seed cavity.

I have never seen any Elm answering to Syme's description, growing either spontaneously or planted, except in Kew Gardens. The description of the samara is taken from a Kew tree labelled *U.* (*scabra*) *glabra*.

2. **Ulmus vegeta.**

U. (*montana*) *glabra 2 vegeta* Loudon, Arboretum, iii. 1404 (1838).

Huntingdon Elm.

Samara large, broadly obovate, very obtuse, with the seed cavity placed above the centre; notch reaching half-way to cavity, occasionally nearly to cavity, its basal angle acute. Seed cavity long, acute at both ends; seed usually perfected.

Leaves large, broadly oval, acute or slightly acuminate, coarsely and doubly crenate; upper surface epilose, slightly scabrous; midrib and secondary veins with scattered hairs beneath; petioles very hairy, twigs and buds slightly hairy.

Large tree, 60 to 70 ft., with conspicuous bole and long, straight, ascending branches, ultimate divisions at length drooping. Bark smooth, light-coloured; suckers present.

Resembles *U. glabra* in size and shape of leaf, but differs somewhat in habit, and essentially in the samara and in the presence of suckers. The leaves of the suckers are highly scabrous; on the tree they are always less scabrous than in *U. scabra*, and occasionally nearly or quite smooth.

This Elm is said to have been first brought into notice in 1836 by a John Wood, a Huntingdon nurseryman, whose uncle, a market gardener, raised it from seed collected in the neighbourhood eighty or ninety years before (Loudon). Plants said to be descendants of the original trees are still shown at Huntingdon. It has been universally, so far as I know, regarded up to the present time as a hybrid. I have ventured, without prejudice to the question of its hybrid origin, to treat it in this paper as an independent species, looking to its samara characters, the fertility of its seeds, and the presence of suckers. I am, however, informed by Dr. Moss that experiments conducted at Cambridge in 1909 point to hybridity (*U. glabra* Mill. × *scabra* Mill.). It can usually be recognized from *U. scabra* at a distance by habit alone.

Native in East Anglia? In the West, probably only occurring where planted or self-sown from planted trees. Of late years *U. vegeta* has been the favourite Elm for planting in many parts of England.

3. Ulmus glabra (*glaber*) Miller, Gard. Dict. ed. 8 (1768); Hudson, Fl. Angl. 95 (1762), *pro parte*; Smith, Eng. Bot. t. 2248 (1811); Lindley, Synopsis, 226 (1829); Loudon, Arboretum, iii. 1403 (1838).

U. campestris Linn. Sp. Pl. 1753, *pro parte*; Miller (1768); Smith, Eng. Bot. t. 1886 (1808); Lindley, Synopsis, 226; Loudon, *et auct. plur.* See notes on synonymy at the end of this paper.

"*U.* (*glabris*) *foliis ovatis glabris acute serratis*. The Smooth-leaved Witch Elm," Miller. "*Glabris*" is corrected by Miller on his last page to "*glaber*."

Samara varying in size, broadly obovate or oblong; notch open or closed at the top, very conspicuous, its basal angle rather obtuse, reaching nearly to the seed cavity, which is short and shortly pointed; seed maturing.

Young twigs, buds, and petioles more or less hairy; leaves slightly scabrous or smooth above, often plainly glandular beneath, as is also the samara (var. *glandulosa* Lindl.), epilose above and below except on the midribs and secondary veins and at the axils; ovate or obovate-cuneate, shortly or longly acuminate, very unequal at base; varying much in size and shape, but nearly always narrower in proportion to their length than in *U. major* or *U. surculosa*. Bark light-coloured, smooth or (var. *suberosa*) suberous. Suckers freely produced.

Bole conspicuous, forming a tree mostly slighter and lower than any of our other species; occasionally as tall as *U. surculosa*; ultimate divisions very slender, usually drooping; twigs sometimes bearing distichous leaves (var. *stricta* Lindley).

Native in the south-west, south, and east of England; in the West, Midlands, and Wales, only so far as I know when planted; producing fertile seed freely. Common throughout England as a planted tree. Most of the trees planted in recent years in avenues in or near towns belong either to *U. vegeta* or to one or other variety of this species. *U. glabra* is much better fitted for this

purpose than *U. surculosa*, being a smaller and more manageable tree, not liable as that to sudden breakage of the limbs.

U. glabra is a polymorphous group of forms, which may perhaps be rightly treated as a single species, being identical in samara characters and possessing a great general likeness in habit.

Var. *glandulosa* Lindley, Syn. *op. cit.* 227.

"Leaves very glandular beneath. Terrace of Ludlow Castle," Lindley, *l. c.*

Specimens of the Ludlow tree, in Herb. Mus. Brit. and in the University Herbarium at Cambridge, show it to have leaves very glandular beneath, narrowly oblanceolate or elliptic, scabrous and epilose above, pilose beneath. Forms of *U. glabra* exist exhibiting the same glandular development but without the same shape; these must probably be placed under var. *glandulosa*.

Var. *stricta*.

U. stricta Lindley, *l. c.* 227.

U. campestris var. *cornubiense* Loudon, *l. c.* 1376.

Samara as in the type. Leaves of the tree usually or always smooth as well as epilose above and below, except at the axils, small; those of the suckers and seedlings usually or always scabrous above, often very small; twigs bearing regularly distichous leaves. Height in exposed situations 30 to 40 ft.; where sheltered, rising at times to 70 or 80 ft.

Very abundant, and apparently native in West Cornwall; becoming less abundant in East Cornwall and West Devon. Abundant in Brittany.

Var. *minor*.

U. minor Mill. Gard. Dict. 8 (1768).

U. tortuosa Host Fl. Austr. i. 330 (1827)?; Reichenbach, Icones, fig. 1330.

"Foliis oblongo-ovatis glabris acuminatis duplicato serratis . . . Ulmus minor folio angusto scabro. . . . Hedgerows in several parts of England. The branches of this sort have a smooth grayish bark and grow erect. The leaves are narrower and more pointed than those of the English Elm, and are smoother; they are later in coming out in spring than those, but continue longer in autumn. This has been called by some the Irish Elm." Miller, *l. c.*

Usually a smaller tree than the other varieties, with stiff, much-divided twigs; the leaves small and very scabrous.

Reichenbach's figure shows the samaras much less distinctly here than in the other Elms; either they were drawn from an immature specimen, or the wing of the samara is undulated and very distinctive.

A specimen collected by Buddle near Maldon, in Essex, in 1711, and named by him in his herbarium (Herb. Sloane, 126, f. 38), "Ulmus foliis parvis glabris, the little Wych Elm," agrees well with Reichenbach's figure, especially in the small leaves and stiff undulating twigs.

I possess a good specimen from Skellingthorpe, South Lincoln, showing the same characters.

Native in East Anglia ?

Var. *suberosa*.

U. suberosa Moench, Verz. Ausl. Baume, 136, 1785; Ehrhart Beiträge zur vi. 87 (1791); *non* Smith *nec* Lindley *nec* Loudon.

U. tetrandra Schkuhr (1791); Reichenb. Icones, 1333.

"Rami suberosi. Folia inæquilatera, duplicato-serrata. Pedunculi æquales brevissimi: Samaræ nudæ." Ehrh. *l. c.* I have not seen Moench's description.

Samara as in type. Leaves obovate acuminate, scabrous or smooth on the upper surface; those of the suckers smaller, less long-pointed, more scabrous. Suckers and young boughs from the second or third year very suberous; bark of the bole and large boughs not suberous. Rare in Britain; I have only seen planted trees in Salisbury Cathedral Close and in Kew Gardens. It is, however, not rare in Brittany, and will probably be found native in Britain near the sea in the south-western counties.

Two young trees of this variety cultivated at Kew show the suberosity of the branches extending ten feet or more very beautifully. One of these trees has leaves closely resembling native trees which I have seen at Dinan and Concarneau, Brittany; the other has them with a longer acumination, but both are clearly *U. suberosa*. The scabrosity or smoothness of the upper surface seems to vary greatly.

The above account must not be thought to exhaust the varieties of this polymorphous tree. The synonymy, as seen in the older British authors, or as quoted by Richter in *Plantæ Europææ* (ii. 72), indicates that many named varieties remain to be noticed. Until, however, those quoted by our British authors can be identified, it seems premature to endeavour to identify any British trees with Continental varieties.

The specimens of *U. glabra* γ *latifolia* Lindl. Syn. 227 in his herbarium at Cambridge are without fructification, and the plant must remain doubtful.

4. Ulmus major Smith, Eng. Bot. t. 2542, Lindl. Syn. 226 (1818).

Samara rather large, broadly and shortly obovate, very obtuse; notch often closed at the top, its basal angle rather obtuse, reaching nearly or quite to seed cavity: seed ripening.

Leaves large, very broadly oval, doubly and coarsely crenate, dark green; epilose and slightly scabrous above and beneath. Twigs nearly epilose, petioles and midrib pilose. Suckers numerous, their leaves varying greatly in size and pilosity.

A large spreading tree, height 50 to 60 ft.; bole short, usually curved; branches long, drooping, pointed, ultimate divisions rather thick. Bark of the lower stem branches and of the suckers from two to four years old, deeply and remarkably suberous; that of the main trunk rough, dark-coloured; of the branches and twigs, smooth.

Scattered throughout the lowlands of England and Wales; often in company with *U. surculosa*; but, unlike that, extending into mountain valleys (at least in South Wales) up to 1000 ft.; apparently native, certainly spontaneous.

5. Ulmus surculosa Stokes, Bot. Materia Medica ii. 35 (1812).

U. suberosa Smith, Eng. Bot. 2161 (1810); Lindl. Syn. 226; Loudon, Arboretum 1395; *non* Moench *nec* Ehrhart.

"Leaves doubly serrate, ovate or elliptic. Flowers nearly sessile, conglomerate. Roots throwing up suckers . . . . Native probably of some part of Europe, semi-naturalized in Britain, its seeds rarely if ever ripening." Stokes, *l. c.*

Samara nearly orbicular, usually smaller than in *U. glabra*, half inch at most; notch conspicuous, its aperture closed, with rounded edges, its base not angled but evenly curved, reaching almost or quite to the short broad seed cavity; seed never (?) maturing.

Leaves full green, of moderate size, broadly ovate with shortly acuminate points, or subrotund obtuse; upper surface slightly scabrous, nearly epilose at maturity; under surface hairy on the veins; twigs, buds, petioles, and midribs hairy. Bark brown, rough on the bole, smooth on branches and twigs; often suberous on the suckers and small twigs of the lower part of the bole; more often smooth on these parts. Suckers very numerous; produced from shallow roots as far as a hundred yards from the parent-tree.

Tree tall, narrow or broad, attaining 120 ft., with conspicuous and straight central bole; its branches (except when crowded) large, heavy, spreading; ultimate twigs stiff, crowded, much divided, not drooping, producing rounded masses of dense foliage. The limbs of old trees in this Elm are liable to fall suddenly without any apparent cause, as well as in gales; hence it is dangerous for avenues in or near towns.

The leaves are often small or very small and more pointed in shape, in dry situations or in the undergrowth of hedges; on well-grown trees they differ little in size and shape. Easily recognizable from a distance by the shape of the bole and the massiveness of the foliage. It does not seem to be liable to any variations, as is *U. glabra.*

Throughout the middle and southern districts of England, on lower ground, both on its eastern and western sides; attaining its greatest size in the river valleys of the Thames, Severn and Wye, the timber reaching maturity in about one hundred years.

The "English Elm" has long been considered not to be indigenous to Britain, owing to its habit of never maturing fruit. It appears, on the contrary, so far as investigation has gone, to be endemic to Britain, its only records of occurrence out of Britain being one or two spots in Spain (Granada and Aranjuez) where the trees are known to have been introduced from Britain. The habit of non-ripening its seed is therefore rather to be traced to its success in propagation by suckers.

TWO NEW MYCETOZOA.

By G. Lister, F.L.S.

Physarum alpinum, n. sp. Sporangia sessile, clustered, subglobose, 1 to 1·3 mm. diam., or forming curved or straight plasmodiocarps 2 to 10 mm. long, ochraceous-yellow, smooth or somewhat scaly; sporangium-wall double, the outer calcareous layer tending to separate from the inner membranous layer. Capillitium consisting of rather large simple or branched yellow lime-knots connected by firm hyaline threads. Spores purple-brown, minutely warted, 10 to 15 μ diam.—Until last year only two gatherings of this robust alpine species were recorded, obtained respectively from the Blue Cañon, California (*leg.* Harkness, 1877) and from Arolla, Switzerland (*leg.* Lister, 1907); they were described in this Journal, xlvi., p. 216, under the name *Physarum virescens* Ditm. var. *alpinum*, n. var. In the spring of 1909 the same form was found abundantly by M. Ch. Meylan in the neighbourhood of Ste. Croix in the Jura Mountains, at an elevation of 4000 ft., where it appeared on twigs and herbage after the thawing of the winter snows; it was associated with *P. vernum* Somm., to which the long plasmodiocarps of *P. alpinum* bear some resemblance; the latter can, however, be at once distinguished by their yellow colour. M. Meylan's gatherings confirm the constancy of the form and emphasize the characters that separate it from *P. virescens*.

Physarum carneum Lister & Sturgis, n. sp. Sporangia scattered, stalked, subglobose, 0·4 to 0·6 mm. diam., ochraceous, smooth or rugulose; sporangium-wall membranous, pale yellow, with evenly distributed deposits of lime-granules, thicker at the base. Stalk pinkish flesh-coloured, translucent, furrowed, without deposits of lime, 0·2 to 0·3 mm. high. Columella minute and shortly conical, or none. Capillitium a dense network of angular branching white lime-knots and short connecting hyaline threads. Spores purplish-brown, spinulose, 8 μ diam.—This species was found in some abundance on dead wood, on Cheyenne Mt., Colorado Springs, Colorado, by Dr. W. C. Sturgis, in the autumn of 1908. It appears to be allied to *P. flavidum* Peck (syn. *P. citrinellum* Peck, *fide* Dr. Sturgis), from which it differs in the membranous sporangium-wall, in the slender flesh-coloured stalks and in the smaller spores. It somewhat resembles round-headed forms of *Craterium aureum*, Rost. (syn. *C. mutabile* Fr.), but is distinguished by the buff colour of the sporangia and white lime-knots.

NOTES ON THE FLORA OF FLINTSHIRE.

By A. A. Dallman, F.C.S.

(Continued from p. 53.)

**Asperula arvensis* L. Several plants amongst a patch of aliens by railway sidings, North Hendre Mines, near Rhydymwyn, Sept. 1909.

Kentranthus ruber DC. Walls, Holywell.

Valerianella olitoria Poll. Sealand, *New*; Field, Bagillt; Marian, Cwm.

Dipsacus sylvestris Huds. Very fine and plentiful on island in Elwy, *Day & A.A.D.*; waste ground by St. Asaph Station.—*D. pilosus* L. Kinnerton, *Potts*.

Scabiosa Columbaria L. Moel Findeg; the Leet.—*S. succisa* L. A frequent and characteristic plant on the limestone commons, though not confined to such situations. As the flowers are distinctly protandrous, and anthesis takes place at a time when most of the conspicuous flowered plants of such a situation (e.g. *Helianthemum*, *Primula veris*, &c.) have ceased to bloom, this species largely monopolises flower-frequenting insects and cross-pollination generally results.

Eupatorium cannabinum L. By stream near Cae Gwyn, Tremeirchion; Llanfynydd; along the Clwyd; Coed Cochion, near Caerwys.

Solidago Virgaurea L. Bilberry Woods, Hawarden, *Thomas*; Pandy Lane, Dyserth, *Day*; Caergwrle Castle Hill; between Sarn Mill (Nannerch) and Bryn Goleu; Moel Findeg; between Bryn Gwyn Villa and Glyn Isaf (near Caerwys); frequent along wooded parts of Mold Valley; on colliery refuse between Glan-y-Don and Mostyn.

**Aster* sp. There were several large clumps (Sept. 1909) of a species of "Michaelmas Daisy" on the island in the Elwy, just above the junction with the Clwyd. There were no houses anywhere in the vicinity, but it may have been carried here from somewhere higher up the river.

Erigeron acre Linn. Near Caergwrle, July 31, 1872, *Herb. Harris*. This is probably my Ffrith station. Between Padeswood station and the pool; the Graig, Tremeirchion; Mostyn Quay; west slope of Moel Hiraddug; on a dreary expanse of alkali and furnace refuse by the shore below Pentre, south-east of Flint.

Inula squarrosa Bernh. Near Mold, Sept. 1, 1869, *Herb. Harris*. Between Llanfynydd and Ffrith.

Anthemis Cotula L. Between Kinnerton Station and Kinnerton Bridge Farm; railway siding by North Hendre Mine.

Chrysanthemum segetum L. Weed in Mold Churchyard; one plant by Pant, near Caerwys.—*C. Parthenium* Bernh. Island in Elwy, *Day*; Whitford; Ysceifiog; by Nant Brook above Pont Bleiddyn.

Matricaria inodora L. β **salina* Bab. Banks and mouth of Clwyd, near Rhyl; Queensferry; Saltney.—*M. Chamomilla* L. Flint, *Potts*; Dobs Lane near Bilberry Woods, *Thomas*. Bretton Lane, *Thomas* (sp.).

Tanacetum vulgare L. Sealand, *New*. In profusion on island in Elwy, *Day & A.A.D.*; Dee Cop near county boundary; between Caerwys and Bryn Du; along the Elwy; by the Clwyd, between St. Asaph and Rhuddlan; waste ground between mouth of Wepre Brook and Connah's Quay; along the coast N.W. of Connah's

Quay; roadside north of "Black Lion" inn, towards Babell, near Caerwys.

Artemisia Absinthium L. Mine refuse, Bagillt; between Greenfield and Holywell; waste ground by railway N.E. of Mold; several plants between Pentre and Flint; by some houses south of Nannerch Station.

Doronicum Pardalianches L. Half mile beyond St. Asaph, towards Denbigh, *Day*.

Senecio vulgaris L. *β* **radiatus* Koch. Waste ground by the wharf at Connah's Quay, July, 1909.—*S. sylvaticus* L. Plentiful above St. Beuno's College, in a lane near Aelwyd uchaf; near Pont Bleiddyn; on the tumulus (together with *Salvia Verbenaca*) opposite Crugyn Farm, near Rhuddlan; mound of colliery refuse between Llong and Padeswood; west of Lodge Farm.—**S. viscosus* L. In considerable quantity among cinders, &c., by railway track and waste ground adjoining, between Bagillt Station and the Bettisfield Colliery, August, 1909.—*S. erucifolius* L. Pandy Lane, Dyserth, *Day & A. A. D.*; near Llyn Helyg; between Bryn Bella (Tremeirchion) and Pont-y-Cambwll; Dee embankment, between Greenfield and Mostyn; between Cwm and Rhuddlan; on Morfa Rhuddlan Road; eminence on shore by Rockcliff Hall, near Connah's Quay.—*S. Jacobæa* L. The brightly coloured flowers and dense conspicuous corymbs are well adapted to attract the attention of insect visitors, which are numerous. The following visitors were observed towards the end of August on a patch which was growing near Nannerch at an altitude of 760 ft.:—*Bombus muscorum*, *B. terrestris* (both frequent), *Syrphus ribesii* L., *Eristalis arbustorum* L. (frequent), *E. tenax* L. (very frequent), *Mydæa urbana* L., *Lucilia Cæsar*, *Sarcophaga carnaria*. A small and somewhat slender black and yellow banded *Syrphus*, which has not been determined, is also a common visitor. A little beetle, of which I omitted to obtain specimens, also frequented the flowers.

Carlina vulgaris L. Near Cefn-y-Bedd, Flintshire, July 31, 1872, *Herb. Harris*; Holywell Common; Moel Findeg; the Graig, Tremeirchion.

Carduus pycnocephalus L. *β tenuiflorus* Curt. Rhyl, *Mason*; Foryd.—*C. nutans* L. Field, Pen uchaf, Tremeirchion; a solitary plant between Caerwys and Bryn Du; heathy ground near Ysceifiog; a single example in lonely lane near Hawarden Water Works, north slope of Moel Fammau, at 950 ft.; field between Mold and Nerquis; mound of colliery refuse between Llong and Padeswood; the Graig, Tremeirchion; field near Afon wen; Craig Fawr, Meliden; shingles by Clwyd between Rhuddlan and Rhyd-y-Ddauddwr; several plants skirting wood above Ysceifiog Lake; on rubbish by Rhuddlan Foundry. A curious feature of the vegetation on one part of Pen-y-Cloddiau, scattered over a considerable area towards the summit, at an elevation of about 1150 ft. *Cnicus palustris* was also plentiful on the arid hillside hereabouts, an apparently anomalous situation in which to find this more or less hygrophilous species. Perhaps the scanty soil

and dry situation are compensated for by the comparatively high rainfall at this elevation, and the more or less humid atmosphere during the night time.—*C. crispus* L. Pont-y-Cambwll; roadside between Mold and Rhual; between Caerwys and Bryn Du; Ffrith; Llong; Buckley; Llanfynydd; by some cottages between the Alyn and the railway, north-east of Mold; Pont Bleiddyn; about Broomfield Hall, Mold; Padeswood; by the Clwyd, north-east of St. Asaph; between Llong and Broomfield Hall; a single plant below Ty Fry near Bodelwyddan.

Cichorium Intybus L. Among oats in a field south-east of Flint; a single plant amongst a patch of aliens by railway sidings by the North Hendre Mines.

Centaurea Cyanus L. Rhyl, *Mason.*

Picris echioides L. Lane by Bilberry Woods near Hawarden. *Thomas*; Meliden, *Parker*, (sp.); waste ground by railway, and by pool skirting the railway by Bettisfield Colliery; between Cwm and Rhuddlan; frequent by ditches about Morfa Rhuddlan; ditch by lane behind the 'Marsh Inn,' Rhuddlan; one plant on Dee Embankment between Llannerch-y-Mor and Mostyn; skirting a ditch near Ynys, between Rhyl and Rhuddlan; a few plants by railway between Dyserth and Meliden.

**Taraxacum palustre* DC. The Leet, *W. G. Travis* (fide *Wheldon*).—*T. erythrospermum* Andr. Prestatyn.

**Lactuca virosa* L. Scattered over heaps of furnace refuse, in some quantity between Mostyn Iron Works and the Quay, Sept. 1909.—*L. muralis* Gaertn. Near Cefn-y-Bedd, July 31, 1872, *Herb. Harris*; between Tremeirchion and Rhuallt; Lygan-y-Wern above Bagillt; on limestone in wood by lake below Ysceifiog; Caerwys Hill.

Tragopogon pratense L. Between Buckley Junction and Kinnerton, *Thomas*; Saltney and Bretton, *Thomas*; Dee Embankment, Bagillt; between railway and the Alyn near Mold; roadside near Caeau Cochion north of Ysceifiog; Tryddyn; Marian, Cwm; between Shotton and Connah's Quay; embankment in field north-west of Hawarden Bridge; roadside crossing railway below Nannerch; Queensferry; about the Marine Lake, Rhyl.—*T. minus* Mill. Rhyl, *Mason.*—*T. porrifolium* L. A single plant skirting ditch by lane behind the 'Marsh Inn,' Rhuddlan, Sept. 1909.

Jasione montana L. Lane near Ffrith Hall; Caergwrle Castle Hill; lane on Hope Mountain; between Tyn twll and Plas Yw, near Nannerch; between Nannerch and Sarn Mill; Bryn Goleu near Nannerch; west of Lodge Farm near Caerwys; roadside north-west of Crugyn Farm near Rhuddlan; along lane skirting wood south of Marian, at about 820 ft. In Flintshire appears to be calciphobous, favouring the grit rock districts.

Campanula Trachelium L. On both sides of hill between Caerwys and the station; hedges by road between Caerwys and Pant.—*C. latifolia* L. Between Rhos-esmor and Northop; thicket by lane-side between Caergwrle and Waen-y-Llyn.—*C. rotundifolia* L. A frequent species, often occurring in company with *Teucrium Scorodonia*. Attains greatest Flintshire elevation

on summit of Moel Fammau (1820 ft.), where it grows in crevices amongst loose stones in company with *Oxalis Acetosella*. The flowers are protandrous, the three stigmatic lobes not unfolding or becoming receptive until after the pollen is shed. The pendulous habit, in addition to protecting the pollen from rain, is also of use in minimising any chance of self-pollination, which rarely or never occurs. The flowers are commonly tenanted by numerous minute insects which may sometimes assist in cross-pollination. Flies are frequent visitors, and I have occasionally observed *Pieris rapæ* sipping honey. The flowers appear to be used as hibernacula by various insects in wet weather and at night time, a fact previously remarked by Müller.

Erica Tetralix L. Plentiful on north side of Pen Llun-y-gwr, to 1150 ft.; Gwern Mountain; swamp between Talwrn glas and Gwern.

Vaccinium Vitis-Idæa* L. In quantity on Gwern Mountain, at about 1120 ft., Sept. 1909. A very local species in Flintshire, and apparently absent from the greater part of the Clwydian range, being confined to a limited area close to the Denbigh border. Perhaps its absence from the Moel Fammau range is owing to the very dry nature of the greater portion of this plateau.—V. macrocarpon* Ait. Soughton near Mold, 1859, *Herb. Potts*. There are also examples in the Harris herbarium labelled "Soughton Bog near Mold: ex Herb. Miss Potts." I have no further information regarding the occurrence of this North American plant in Flintshire, and I am unacquainted with any suitable locality in the neighbourhood of Soughton where it might occur at the present day.

Primula veris L. × *vulgaris* Huds. There are examples of this hybrid in the Harris herbarium labelled "*Primula officinali-vulgaris*, Nant-y-Ffrith, Flintshire, May 6, 1872."

Lysimachia vulgaris L. Bank of Clwyd just below Pont-y-Cambwll, and also occurs on the Denbigh side of the river. [This also occurs in ditches by the road between Lower Kinnerton and Bretton, but the station is a few yards beyond the Flint boundary and in Cheshire.]—*L. Nummularia* L. On the road to St. Asaph from Meliden, ***Miss L. R. Cooke.***

Anagallis tenella Murr. By stream above Hawarden Water Works, north slope of Moel Fammau, at 1150 ft. I have had the Bog Pimpernel under observation in its native haunts for some time, but have been unable to determine the pollinating agent or mode of pollination.

(To be continued.)

SHORT NOTES.

ZANNICHELLIA GIBBEROSA Reichb. (p. 55).—Mr. Druce's interesting note on the discovery of this plant as a British species directed my attention to a form of *Zannichellia* I gathered last September in North-east Surrey, and that I was not able to make

agree with the book-characters of any British form. Mr. Druce, who has recently seen an example of this plant, writes that, "although not extreme, it must go under *Zannichellia gibberosa* Reichb. Some of the fruits are quite spiny on both sides; the fine leaves; the long beak to the carpels are also typical." I gathered my plant from a small pond where it was abundant, near North Cheam, in a brickfield occupying a portion of the site of the former Morden Common, some traces of which still exist. The most noteworthy features of the Surrey plant are its slender habit and the character of the *quite* mature carpels, which are grey-looking and decidedly spinose on both edges, and, to a lesser extent, on the sides. I am afraid it will be necessary to keep an open mind, at present, as to whether *Zannichellia gibberosa* is a genuine native of Surrey, as, apart from the character of its habitat, it is there associated with a species one does not usually meet with by inland waters, namely, *Scirpus maritimus*.—C. E. Britton.

Rhinanthus *versus* Alectorolophus (p. 53).—Both Mr. Williams and Mr. Hiern in discussing the above names ignore Hill's *Herbal*, p. 121 (1756), which precedes Haller's restoration or establishment of the genus *Alectorolophus* (Stirp. Helv. 137, 1768). Hill uses the name *Rhinanthus*, and well defines the genus, but wrongly includes Burman's Ceylon plant (*Goniospermum elongatum*). But the point is that under the name *Rhinanthus*, the Yellow Rattle is well described, and thus the name may be cited as clearly defined by Hill, *l.c.*, and by Hudson (*Flora Anglica*, p. 234 (1762)), where the generic characters are also given. There appears, therefore, to be no sufficient reason to give up the name *Rhinanthus* L. as amended by Hill and Hudson before Haller re-named it. Linnæus was of course to blame for not taking up Haller's name; but this is by no means the only instance of his injustice to his botanical rival.—G. C. Druce.

"Hayward's Botanist's Pocket Book" (p. 61).—May I say that the position of *Limonium recurvum* Salmon in the edition for which I am responsible is the same as in the preceding one, *i.e.* I keep the same grade for it as formerly. I may say that in certain ways I had to conform as far as possible to the original plan: had I had quite a free hand, I should not have used names which are not according to the law of priority, &c. The reduction of many plants which stand as species in my *List* was also necessitated for the sake of consistency and usefulness—*Juncus effusus*, *Carex magellanica*, *Eleocharis uniglumis*, *Allium sibiricum*, *Helleborine media*, *Betula tomentosa*, *Atriplex deltoidea*, are examples of species reduced to varietal rank. The species are therefore nearer to the standard of Bentham's *Flora*. This to the student is more useful and easy than too great segregation. In the ninth edition of the *London Catalogue*, *Statice Dodartii* (*Limonium recurvum*) only had varietal rank; that, too, was the grade given to it in Hooker's Student's *Flora* and by Boswell Syme in the third edition of *English Botany*, therefore I hope Mr. Salmon will excuse my following in the old wake. It stands as a full species in my *List*,

in which all the above plants and the *Hieracia*, *Rubi*, &c., are given specific rank. I hope that, while not mainly written as a description of all the plants in my *List*, the *Pocket Book* may throw some light on many of the plants included.—G. C. Druce.

Daphne Laureola × Mezereum in N. Somerset.—I have reported this hybrid from woodlands between Somerton and Kingweston, 1907; two plants occurred which were referred to this, one being more satisfactory than the other. A cutting of the latter has flowered, and is ordinary typical *D. Laureola*. Messrs. Druce, C. E. Salmon, and J. W. White probably received specimens from this second bush, as they all objected (rightly as is now clear) to the determination. My own herbarium specimens (from the first and more characteristic bush), on the contrary, show strong influence of *D. Mezereum*, and I consider that they represent a *per-Laureola* form of the hybrid, whereas the originally described deciduous-leaved form, from North Wood, Slindon, W. Sussex, is a *per-Mezereum* form. The Somerset hybrid is doubtless due to the fertilization of *D. Laureola* by insect-borne pollen of *D. Mezereum*.—Edward S. Marshall.

Plants of North Devon (p. 56).—With regard to Mr. Druce's note thus entitled I would point out that all the Exeter District is in Watson's v.-c. 3; its plants, therefore, can scarcely be described as in "North Devon" (v.-c. 4). In the list he gives of "additions to *Topographical Botany* noticed near Exeter" in 1908, is one plant, *Radicula palustris* Moench, that so long ago as the year 1829 was given in the *Flora Devoniensis* (under its old name of *Nasturtium terrestre*) as growing "at the side of the river at Exwick." I myself found it abundant at Countess Weir (by the Exe), in 1894.—C. E. Larter.

The late J. H. Davies (p. 57).—In connection with Rev. C. H. Waddell's note respecting the work of the late J. H. Davies, it may be of interest to record that in the Parfitt Collection of Mosses, now in the Museum of the Torquay Natural History Society, there are a good many specimens sent to Mr. Parfitt from Thirsk by Mr. Davies. Also a number collected by the latter in the Isle of Man, together with a letter from Mr. Davies concerning these, dated 'Thirsk, 23rd April, 1857," in which he refers to them as collected there by him in the previous year (1856) during a visit to the island of only three or four days, during which he noticed there "in all about a hundred and ten species."—C. E. Larter.

Lathræa Clandestina L. (Journ. Bot. 1909, p. 123).—In the *Report of the Botanical Exchange Club* for 1908 (p. 337) Mr. Druce says: "It is a matter for regret that this should have been published without due enquiry being first made at Cambridge. The fact would have been elicited that specimens of *L. Clandestina* from the Botanic Gardens had been planted in a wild-looking station." The implication that no enquiry was made is inaccurate, as Mr. Reynolds took steps in that direction before publishing his

note. The "matter for regret" appears to us to lie in the fact that the Cambridge Botanic Gardens should connive—as it seems to have done—in the establishing of a foreign plant "in a wild-looking station."

AGROSTIS VERTICILLATA Vill. IN CORNWALL.—On June 13th, 1907, I found at the eastern end of Falmouth Docks, growing with *Melilotus alba* and *Carum Carvi*, several plants of a strange grass which I then took to be an unusual form of *Agrostis alba* L. var. *maritima* Meyer. Recently I received some Guernsey specimens of *Agrostis verticillata*, and on comparing my Falmouth Docks plant with them I found they were perfectly identical.—F. HAMILTON DAVEY.

VIOLA HIRTA × SYLVESTRIS IN HEREFORDSHIRE. — Specimens from the limestone of the Great Doward, collected on May 15th, 1908, were sent to the Botanical Exchange Club by Mr. Ley under this name. Mrs. Gregory considered them to be "a very marked example of *V. Reichenbachiana* Reichb. f. *villosa*." Last April I saw plants in good flower in Mr. Ley's garden at Brampton Abbots, and the evidence in favour of this hybrid origin appeared to me quite conclusive. The look of *V. hirta* is partially lost in drying.—EDWARD S. MARSHALL.

ABNORMAL CAREX (p. 56).—Sir James Stirling writes to say that the discovery of the abnormal stems which formed the subject of Mr. Hanbury's note was made by our correspondent Mr. W. E. Nicholson.

REVIEWS.

Cronologia della Flora Italiana, ossia Repertorio sistematico delle più antiche date ed autori del rinvenimento delle piante (Fanerogame e Pteridofite) indigene, naturalizzate e avventizie d'Italia e della introduzione di quelle esotiche più comunemente coltivate fra noi di P. A. SACCARDO. 4to, pp. xxxvii. 390. Price 15 lire. Padova: Tipografia del Seminario.

WE regret that circumstances have prevented us from sooner calling attention to the latest of the many admirable works with which, in more than one direction, Prof. Saccardo has enriched botanical literature. The two volumes in which he gave us the literary biographical history of *La Botanica in Italia*, as he entitled the work, were duly noticed in these pages: he now, as the above-quoted title shows, approaches a more formidable task, which he executes in the thorough and scholarly manner which has characterized his previous undertakings.

The only work with which we can compare the *Cronologia*—and it is comparing a great thing with a small—is Mr. W. A. Clarke's *First Records of British Plants*; but Prof. Saccardo had to occupy a far wider field, whether we regard the number of plants included in his enumeration or the extent of the literature, begin-

ning with classical times, which he has had to examine for carrying that enumeration out. The number of species alone reaches 4093, but the author does not content himself with these—he has included all the principal varieties, which practically doubles the number. He groups his plants chronologically under six heads, the summary of which shows the growth of the knowledge of the flora :

A. Classical plants (known in the Roman epoch) . .	408
B. Mediæval plants (known in the mediæval period) .	189
C. Plants added in the sixteenth century	1171
D. Plants added in the seventeenth century . .	814
E. Plants added in the eighteenth century . .	1311
F. Plants added in the nineteenth and beginning of the twentieth century	4107
	8000

In addition to these there is a list of species commonly cultivated, naturalized, or adventitious, amounting to 713; these, divided into periods corresponding with those named above, stand respectively as 78, 19, 127, 58, 175, 256. Of the 713, 382 occur exclusively in cultivation, and show no tendency to become acclimatized.

The interesting preface, from which we extract these tables, gives details of the scope and plan of the work, as well as much information of the status of the plants which form the Italian flora as understood by the author. It is followed by an excellent bibliography of the works cited, arranged under the names and authors, the date and publication of each work being given. Then comes the catalogue of plants, systematically arranged, beginning with the ferns; under each name is given not only the name of the author who first recorded it as Italian, but also of other early writers who have mentioned it, the works in which the plants are recorded being easily ascertainable from the bibliographical list. Critical notes as to the status of the species or references to papers in which it is dealt with are added when these seem useful or necessary, the whole being compressed into the smallest compass consistent with clearness. The following examples from the first page will indicate the method pursued :—

"*Ceterach officinarum* W.

"**1415** Rinio—1532 Cibo—1551 Aldrovandi—1554 Mattioli—1561 Anguillara—1563 Cesalpino—1585 Durante—1595 Pona."

"*Gymnogramme spectabilis* Zumagl.

"**1860** Zumaglini (sp. dubbia)."

"*Woodsia glabella* R. Br.

"**1858** Hausmann in Bertol. xi—1864 Molendo. Cfr. Dalla Torre e Sarnthein, 1900—1872 Huter, cfr. come sopra—1873 Venzo in *N. giorn. bot. ital.*"

After this enumeration come the cultivated plants, treated in manner following :—

" *Cedrus Libani* (Barrel.) Loud.

" Originario dell' Asia minore, Siria e Urali e già conosciuto in Italia dall' era romana in poi (Plinio, Mattioli 1565, Cesalpino 1583 ecc.) ma coltivato fra noi solo dalla seconda metà del settecentro.

" **1760** Marsili, ed. 1840—1787 Savi. Cfr. Targ.-Tozz. 1853—1820 Bonato."

Following this we have lists of the plants arranged in the periods in which they are grouped, with an indication of the year in which they were recorded, the whole concluded with an index of genera..

From what has been said it will be gathered that the work is a monument of labour, learning, and scholarship, such as we are accustomed to associate rather with Germans than with Italians. But so far no other country has produced anything to be compared with this *Cronologia*; we can only hope that the work so admirably carried out by Prof. Saccardo will find imitators in other lands.

Vorträge uber Botanische Stammesgeschichte. Zweiter Band. — Cormophyta Zoidogamia. Von J. P. Lotsy. Jena: Gustav Fischer.

This second volume continues the big task Dr. Lotsy has set himself of summarizing the present position of our knowledge of the special morphology of plants. The preceding volume dealt with the Thallophyta; this one treats of the Bryophyta, Pteridophyta, Pteridospermeæ, Cycadophyta, Cordaitales and Ginkgoales. The *Coniferæ* and Gnetales remain to be described along with the Angiosperms. When the extent and importance of the phyla dealt with are taken into consideration, the size of the volume, which contains forty-six lectures and runs to over eight hundred pages, will not appear excessive. It, however, makes detailed criticism out of the question in a review, and we can only offer some more general remarks on the work.

In the first place, its value to teachers of botany and to senior students may be emphasized, though it is self-evident. To be able to turn to a single volume summarizing the main facts known regarding the groups of plants described and to find collected in a bibliography the titles of the more important works to be consulted will be of constant use. So much original work has been done on these phyla in recent years and the difficulty of summarizing the results contained in scattered papers is so great that the assistance afforded by Dr. Lotsy's published lectures will be appreciated by teachers throughout the world. The labour involved in the preparation of these lectures will not be lost, for the work will certainly find a place in the library of every botanist and of every botanical school.

The lecture form in which the book is cast leaves doubtful the precise place it is intended to take in botanical literature. There is a great difference between a good advanced course of lectures on a subject and such works as Sachs' *Lectures on Vegetable Physiology* or Scott's *Studies in Fossil Botany*. In works like

these two a subject is integrated by the special knowledge of the author, and the form of presentation is in itself a contribution to the science. The impression that grows upon the reader of Dr. Lotsy's book is that it has much more the character of an ordinary advanced course on the subject than of a critical work. It is a course on a large scale—no class could stand the detailed exposition of some parts of the subject given here—but on the whole it has the advantages and the defects of an ordinary course of advanced lectures. We obtain from it a fair account of the present position of our knowledge regarding each group discussed, but the account is evidently in large part a compilation from the most convenient authorities. Special prominence is naturally given to organisms and to aspects of the subject upon which work has been published in recent years, but the larger task of creating a clear picture with the assistance of both old and new work is as a rule not attempted. Difficulties also are often not clearly stated or critically considered. These criticisms do not cast any reflection on the value of the book, though they indicate the need of caution in its use. Glancing over one of these lectures is an excellent revision of the main facts relating to the particular subject, and teachers will find the advantage of this even when they differ from the author regarding particular views expressed. The usefulness of the book from this point of view is enhanced by the numerous figures. These greatly diminish the labour of looking up the original sources.

Turning to more specific criticisms, a word may be said of the excessive detail with which some parts of the subject, and these not the most important, are treated. This specially concerns the foliose *Jungermanniaceæ* and the Bryales. While there is no full account of the structure and life-history of any one example of the acrogynous *Jungermanniaceæ*, a large number of genera are briefly described and illustrated. This information, while valuable as showing the range of form in the group, would have gained by being subordinated to a full account of a type or example, such as is, as a rule, given when the smaller groups are being described. In the case of the Bryales, the systematic exposition extends to over one hundred and fifty pages. Surely this part of the course could only be of use to a specialist in the group. Minor examples of lack of balance between parts of the subject are also found in the treatment of Pteridophyta, where the anatomy is fully described in some groups, but in others put so briefly as not to be intelligible without previous knowledge on the part of the reader.

There is little original in the book that calls for mention save perhaps some of the phytogenetic views expressed on the classification adopted by the author, and in the schemes of relationship. Dr. Lotsy lays great weight upon differences in the ciliated reproductive cells as indicating affinity, and this we venture to think has led him into some very unlikely assumptions. The genealogical tree on p. 407 shows the Bryophyta and the *Lycopodinæ* (including the *Lepidodendreæ*, but excluding *Isoëtes*) arising

from one line of Algæ through the Ulotrichales. On the other hand, and contrasted with these *Biciliatæ* as *Polyciliatæ*, we have another line of descent through the *Stephanokontæ*. Leading on to the seed-bearing plants, this includes the Ferns, Equisetales, and Sphenophyllales, together with *Isoëtes*. The position assigned to this latter genus illustrates the preponderating importance the author attaches to this one character. We are also doubtful as to the fruitfulness of the views expressed as to the descent of the Bryophyta. The *Musci* and *Hepaticæ* are given distinct origins from the *Isokontæ*, which sufficiently expresses our complete ignorance of their relationship. But regarding the *Hepaticæ*, Dr. Lotsy is more precise. He places at the base of this group, as arranged in the genealogical tree on p. 212, a hypothetical form, to which he gives the name *Sphæroriccia*. This is assumed to have had the simple thallus of *Sphærocarpus* and the simple sporogonium of *Riccia*. From this hypothetical form all the other *Hepaticæ*, including the *Anthocerotaceæ*, are derived. Without entering into the more detailed relationships of the group, it may be pointed out that this does not take into account the peculiar cell characters of the *Anthocerotaceæ*, which are duly emphasized by the author in his account of the group. It also begs the question of the origin of the complex sporogonium in the *Anthocerotaceæ* and the evolution of the sporogonium in the other groups of *Hepaticæ*.

Space will not permit of more detailed consideration of the views expressed in these lectures. It will be evident from what has been said that, while we do not regard the book as marking any special advance in our knowledge, it will prove a most useful work of reference to all botanists. Probably no one but Dr. Lotsy could have maintained such a general level of accuracy in a summary of our knowledge of the morphology of plants from the Algæ to the Cycadophyta as is shown in these two volumes of his *Vorträge uber Botanische Stammesgeschichte*. Botanists will look forward with interest to the completion of this laborious and valuable undertaking.

W. H. Lang.

Some Popular Books.

The output of popular books dealing in one aspect or another with the British Flora continues to increase in remarkable fashion. In so far as this testifies to the growth of an intelligent interest in plant-life, this is a satisfactory symptom in days when the claims of other branches of knowledge are almost overwhelming, and when the amount of frivolous and useless fiction as well as of *biblia a non biblia* of all kinds indicates that there is a large public who are contented with rubbish and whose needs in that direction are copiously supplied.

A notable feature in most popular books dealing with plants—and the remark probably applies equally to those concerned with other branches of natural history—is that with a very little trouble they might have been made much better. We have more than

once had occasion to make this comment on books which have come under our notice, and it applies to those which are now before us.

Of these perhaps the most attractive is *British Wild Flowers*, by the Rev. Professor Henslow (S.P.C.K., 8s.), and yet to this, as much as to any of the rest, this criticism must apply. We learn from the preface that this is "much more than a 'revised edition'" of Anne Pratt's *Wild Flowers*, but we gather that it may nevertheless be so regarded, although "much new matter has been added and much eliminated from A. Pratt's work." We are told that "the illustrations are all new, having been drawn by Miss Grace Layton from nature" and that they gained a "Silver Flora Medal" from the Royal Horticultural Society, which must have a low standard whether we regard the figures from a scientific or an artistic standpoint. Anne Pratt's book is one of the pleasantest memories of our childhood, and a lively recollection of its illustrations—a little stiff, rather crude in colouring, but strong and firm, and (with very few exceptions) characteristic—enables us to contrast them with the visionary sketchy backboneless fragments by which in this "much more than revised" edition the old figures are replaced. The method of reproduction may be partly to blame for the unpleasant colouring and general indistinctness; but apart from this the figures are not only characterless but absolutely misleading—look at *Ranunculus bulbosus* (fig. 3) with six petals, and sepals not reflexed, or at "*Viola sylvatica* var." (fig. 16). Some plants are incorrectly named; "*Iberis amara*" (fig. 14), of which Pratt had an excellent figure, is here represented by *I. umbellata*—Mr. Henslow has the same error in the text; "*Geranium pratense*" (fig. 30) is evidently *G. sanguineum*; "*Trifolium procumbens*" (fig. 49) is *Medicago lupulina*; *Calamintha officinalis* (fig. 119) is apparently *Salvia verticillata*; why "Russian Sage" (*Salvia bracteata*) (fig. 118) is selected for figuring, to the exclusion of our British species, we cannot guess; the Michaelmas Daisy (fig. 72) though called *Aster Tripolium* can hardly be that species; the figure (59) of Fennel suggests that a *Senecio* has become incorporated with it; *Myosotis palustris* occurs three times—fig. 58 (which we suspect to be *Lycopsis*), fig. 71, and fig. 104—the last quite a good figure, which gives us an opportunity of saying that some of the plates on which only one plant is represented are quite satisfactory (notably that of Tutsan) (fig. 25) and suggest that Miss Layton can do better than most of her work in this book.

We wish we could say that the unsatisfactoriness of the illustrations is compensated for by the excellence of the text, but this we are unable to do. Even in the brief preface "Johns" is called "John"—and this in a S.P.C.K. book!; on p. 2 we have a reference to "J. Gerard's Herbal Historie of Plants"; Marigold is not "from the Virgin Mary" (p. 7), and the slightest acquaintance with Anglo-Saxon vocabularies would have shown Mr. Henslow that it was not "transferred to the *Caltha*" from *Calendula*; "toute-saine" hardly means "all's well" (p. 51) as applied

to *Hypericum Androsæmum*; "*Molochia*" (p. 58 and index) should be *Melochia*; and so we might continue. The most conspicuous fault of the text, however, is in its failure to convey knowledge which might be useful to the young botanist in discriminating species, and might well replace the scraps of verse and miscellaneous items. It is much to be regretted that the S.P.C.K., with its wide sphere of influence, should allow itself to be responsible for so unsatisfactory a volume.

A First Book of Wild Fowers, by Margaret M. Rankin, with one hundred and twelve illustrations in colour by Nora Hedley (Melrose, 6s.), comes nearer the old "Pratt" than any recent book we have seen, and—if the S.P.C.K. has superseded that by their volume just noticed—may well replace it for quite young folk. The plates, although in a few cases scrappy—it is a mistake in books of this kind to put more than one plant on a plate—are artistic, accurate, and well printed, and in all respects, as will be seen at once by any one who will take the trouble to compare them, are markedly superior to those in the S.P.C.K. book. The letterpress is simple and not very instructive, but pleasant in style, and conveys a certain amount of information. Altogether it is a very pretty book in every way (binding included) and we cordially recommend it as a first book for children. But why, one wonders, do not publishers see the necessity of consulting an expert before producing books dealing with technical subjects? The very accuracy of Miss Hedley's figures compels us to tell her that her "*Geranium dissectum*" is not that species—it is *G. molle* or perhaps *G. pusillum*; her "*Verbascum Thapsus*" is *V. nigrum*; and we wonder she did not see that the plant she calls "*Scabiosa succisa*" is identical with the one she figures as *S. arvensis*. And Miss Rankin should not have passed "Chiledonium" and "Spirea."

Mr. W. S. Furneaux has already produced books which have proved useful and stimulating to the young observer; *Field and Woodland Plants* (Longmans, 6s.) is the most recent addition to his "Outdoor World" series. It is a much more informing and generally useful book than those already noticed, containing as it does a general introduction to field botany as well as description of individual plants. "A guide which, though comparatively free from technical terms and expressions, shall yet be strictly correct and scientific" is no easy thing to produce; and Mr. Furneaux, who tells us in his preface that he has attempted to provide this, may be congratulated on the success of his effort. It can hardly be said that "the arrangement of plants and trees according to their seasons, habitats, and habits" is scientific; the author claims that it will "be of the greatest assistance to the lover of wild flowers during his work in the field," as to which we are doubtful, "and also while examining and identifying his gathered specimens at home," which we do not see can be the case. But it must always be remembered that most of those who like to know the names and something about the flowers which they meet with on their walks are never likely to go farther than

this; and for these perhaps the method adopted by Mr. Furneaux is as good as any other arrangement. But his arrangement is a little puzzling; Honeysuckle, for example, is placed under "wastes and waysides"—apparently because there is no heading for "hedges," under which it would seem to come naturally—and so is Rampion, a plant of the Downs. *Wahlenbergia* seems hardly in place under "woods and thickets," though it sometimes grows in woods, while the Yellow Pimpernel, which has at least as much claim to be classed there, comes under "wastes and waysides." Apart from this criticism however—and a note that the figure of "the Barberry" (p. 62) represents not *Berberis vulgaris* but apparently *B. Darwinii*—we have little but praise for the book. It is full of information, every British plant which folk are likely to meet with is included, and the block illustrations from photographs are excellent; the coloured plates with groups we could dispense with. Like all Messrs. Longmans' books it is well printed and suitably bound. But it has one serious defect: there is no proper index! If you know under what heading to look for a plant, you may find it—though not easily—in the lists "classified according to habitats"; if you know its systematic position and its Latin name, you can get at it in the list "classified according to orders," if you know the sequence of the orders; but if you want to find Honeysuckle and don't know that it grows on "wastes and waysides" or its Latin name, you will seek in vain for any indication of its whereabouts in the book. "Which," as Euclid remarks, "is absurd."

The Lighter Studies of a Country Rector (the Rev. John Vaughan, Hon. Canon of Winchester and Rector of Droxford, Hants; Pitman, 5s. net) is so largely concerned with British plants that it may fitly be noticed here. For many years past Canon Vaughan has contributed to various magazines and reviews essays dealing with natural history subjects which have been remarkable for their accuracy and for the pleasant style in which items of (often out-of-the-way) information have been conveyed; and botany and botanists have received no small share of his attention. In the volume before us he discourses pleasantly of Linnæus, Ray, "the poet Crabbe," and John Stuart Mill, of whom he rightly says that few of "the readers of *Principles of Political Economy* suspect that [he] was a rare lover and seeker of wild flowers." Himself a follower in the steps of Gilbert White, he tells us of "Selborne in Early Spring"; of churchyard trees and flowers, the plants of meadow, common and seashore—there is an interesting chapter on the supposed miraculous occurrence of *Lathyrus maritimus* in Suffolk. Notes on the flora of Hampshire and the Isle of Wight, and a chapter on botanical nomenclature—not, happily, in its controversial aspect—are among the contents of this pleasant volume.

It is but rarely that we find Canon Vaughan tripping—we cannot say as much for his printer, for typographical errors are by no means infrequent—but he is wrong in supposing that *Impatiens fulva* (*biflora*) "does not seem to have spread beyond

the county of Surrey"; it had extended through much of the Thames system in Middlesex and Hertfordshire at least thirty years ago, and nearly twenty years before that was abundant along the Ravensbourne near Sydenham (Kent). We are a little surprised that he omits the remarkable *Erythræa capitata* from the plants of Freshwater; and it would have added to the interest of his note on Linnæus had he mentioned that the identical specimen of *Linnæa* which was sent to Gronovius and on which the latter based his genus is preserved in the National Herbarium.

Uniform with the foregoing in price and appearance, and issued by the same publishers, is *In Wind and Wild*, by Eric Parker. In this the botanist is less fully catered for, although the writer has his eye on flowers, trees and shrubs, and a very observant eye it is. Perhaps he is more at home in the garden than in the field, and he is hardly *au courant* with British botany, or he would hardly ask "Are there any fritillaries left at Oxford?" The Iffley meadows seem as full of them as ever—a thing to be wondered at, for long before the flowers expand, folk walk out from Oxford on Sunday afternoons, returning—as we saw them last year—with handfuls of plants, sometimes with the bulb attached, which are only in pale and immature bud. "They comes out in water," said a small urchin who offered us a bunch, when we remonstrated with him on his barbaric proceeding, and we wondered whether this could be true. It is with birds, we think, that Mr. Parker is most at home, and it is on them that he lavishes a certain dainty humour which pervades the book, and of which a good example will be found in the description of sparrows on pp. 131–2. The book is one which every nature-lover will enjoy, none the less because of its literary form; and it has an excellent index—an aid to discovery too often absent from books of this kind.

OBITUARY.

Alfred Loydell, who died at Acton on Jan. 1st, was a keen student of British plants and especially of the Middlesex Flora. He was born at Wood End, Northampton, in 1849; in his early years he studied geology with Mr. Beeby Thompson, of Northampton, and took a great interest in the local fauna and flora. During twenty years' residence in Middlesex Mr. Loydell paid careful attention to plant distribution in that county. On the formation of the Acton Natural History Society in 1901, he was appointed, in conjunction with Mr. C. B. Green, botanical recorder for the district, and with him made a systematic investigation of the Middlesex Flora. The many new records he accumulated will doubtless receive due recognition in the new Flora of the county which Mr. F. N. Williams has in preparation. Late in life Mr. Loydell took up the study of Mosses and Lichens, and to his other studies added that of Conchology. He was a member of the Watson Exchange Club.—A. B. J.

Ready. Royal 8vo. Cloth. 12s. 6d. net, 13s. 3d. post free.

ILLUSTRATIONS OF CYPERACEAE

PREPARED UNDER THE DIRECTION OF THE LATE

CHARLES BARON CLARKE, F.R.S.

Sometime President of the Linnean Society of London.

THE present series of 144 plates was prepared many years ago, when the Author had determined not only upon his plan of arrangement, but also the representative and typical species in each genus. The greater number were reproduced by the collotype process, the other by lithography. Each plate has a separate explanatory leaf of text facing it, to supply information concerning the figures, and of the specimens from which they were derived. It will thus be seen that the plates are authoritative, and form an indispensable complement to the part of the Kew Bulletin.

London: Williams and Norgate, 14, Henrietta St., Covent Garden, W.C.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of November and December (Double Number). — Recent Advances in the Study of Heredity. Lecture V.—The 1 : 2 : 1 and 3 : 9 : 4 Ratios. Lecture VI.—The Mendelian Inheritance of Sexual Characters, by A. D. Darbishire. Observations on Phycoerythrin, the Red Pigment of Deep-water Algæ (Plate V.), by E. K. Hanson. The Embryo-sac and Embryo of *Geissoloma marginata* (Plate VI.), by E. L. Stephens. Notes on *Polyporus squamosus* Huds. (Text-fig. 44), by F. T. Brooks. Hybrids between *Galium verum* and *G. mollugo* (Text-fig. 45), by Eleonora Armitage. *Botrychium lunaria* with two Fertile Lobes (Text-fig. 46), by M. Benson. Vegetation and Frost, by F. F. Blackman. The British Association at Winnipeg, by R. H. Y. Review: German Vegetation, by A. G. T. Notes on Recent Literature: Recent Progress in the Study of the Embryo-sac of the Angiosperms, by E. L. Stephens. British Local Floras, by C. E. M. Fungi, by F. T. B.

Subscription-Price, 15s. per annum (ten numbers) post free.
Price of single number, 2s. *Price of double number, 4s.*

Published Monthly by the Editor, The Botany School, Cambridge.

NOW READY.

Pp. 32, with 2 Plates, in Paper Cover. Price 2s., postage 1d.

THE BRITISH PANSIES.

By E. DRABBLE, D.Sc., F.L.S.

Pp. 24, in Paper Cover, Price 1s., Postage 1d.

LINNÆUS'S FLORA ANGLICA.

London: WEST, NEWMAN & CO., 54, Hatton Garden, E.C.

JUST PUBLISHED. **PRICE 6s. NET.**

With 35 Photo-Micrographs and over 100 Drawings, the whole of which have been specially prepared for this work by the Author.

THE PLANT CELL

ITS MODIFICATIONS AND VITAL PROCESSES.

By HAROLD A. HAIG, M.B., B.S. London,

(*Late Bucknill Scholar, Univ. College, London*).

CONTENTS.—Introduction—The Nature and Reactions of Protoplasm—The Study of a Living Assimilating Cell—Cells of the External Tissues and certain supporting and Protective Tissues in Plants — Meristem—Vascular Tissues—Isolated Tissues or Cells having a special Function—Cells occurring amongst lower Plants—Cell-Divisions—Reproduction—Chemical and Physiological Studies in connection with the Cell—Appendix—Index.

LONDON: GRIFFIN & Co. Ltd., EXETER STREET, STRAND, W.C.

Journal of Botany Reprints.

BOUND SEPARATELY IN PAPER COVER. PRICE 1S. 6D. POSTAGE 1D.

THIRD SUPPLEMENT

TO THE

BIOGRAPHICAL INDEX OF BRITISH & IRISH BOTANISTS.

254 PP., DEMY 8VO, CLOTH EXTRA, PRICE 9S. 6D. NET.

BIOGRAPHICAL INDEX

OF

DECEASED BRITISH & IRISH BOTANISTS.

BY

JAMES BRITTEN, K.S.G., F.L.S., & G. S. BOULGER, F.L.S.

BOUND UP TOGETHER WITH

FIRST (1893–97) & SECOND (1898–1902) SUPPLEMENTS.

The SUPPLEMENTS can also be had separately, price 1/6 each ; postage 1d.

DEMY 8VO, 23 PP., PRICE 1S., POSTAGE 1D.

INTERNATIONAL RULES

FOR

BOTANICAL NOMENCLATURE

ADOPTED BY THE INTERNATIONAL BOTANICAL CONGRESS HELD AT VIENNA, 1905.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

Subscriptions to the Journal of Botany (16s. post free) for 1910 should now be sent to West, Newman & Co.

No. 568 APRIL, 1910 Vol. XLVIII

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

The Orme's Head *Cotoneaster* (Plate 504) 89

Notes on the Flora of Flintshire. By A. A. Dallman, F.C.S. (concluded) 90

Notes on British Carices. By G. Claridge Druce, F.L.S. 98

Marrat's Collection of British Mosses. By J. A. Wheldon, F.L.S. .. 102

William Hillhouse. By G. S. West 105

Some New Jamaica Orchids.—IV. By W. Fawcett, B.Sc., F.L.S., & A. B. Rendle, D.Sc., F.R.S. 106

Short Notes. — 'Algæ Britannicæ Rariores Exsiccatæ'—*Hellebor-ine atroviridis* in Ireland—Out-lawed Generic Names — *Callitriche intermedia* Hoffm. var. *tenuifolia* — *Beta maritima* in S. E. Yorkshire — West Lancashire Mosses—A Correction .. 109

Reviews :—

The Craftsman's Plant-Book. By Richard G. Hatton 112

Report of the Botanical Exchange Club for 1908. By W. Bell .. 114

A History of Botany, 1860–1900. By J. Reynolds Green, Sc.D., F.R.S. 117

Book-Notes, News, &c. 118

Supplement. — The British Roses. By Major A. H. Wolley-Dod (continued).

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had price 1s. 6d. each.

AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

2 pages	25 copies	4s.	4 pages	25 copies	5s.	8 pages	25 copies	8s. 0d.
,,	50 ,,	5s.	,,	50 ,,	6s.	,,	50 ,,	9s. 0d.
,,	100 ,,	7s.	,,	100 ,,	8s.	,,	100 ,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles. Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

COTONEASTER VULGARIS GROWING WILD ON GREAT ORME'S HEAD.

THE ORME'S HEAD *COTONEASTER*.

(Plate 504.)

[This interesting plant formed the subject of an address delivered by its Vice-President, Mr. Willoughby Gardner, F.L.S., to the Llandudno and District Field Club, which is printed in the *Transactions* of the Club for 1908. The paper is accompanied by two plates, one showing an example taken from the Orme's Head, grown in a garden in Llandudno, the other the plant *in situ* in its wild locality: the latter, by the courtesy of the Club, we are enabled to reproduce. The following account of the plant in its only British locality is extracted from Mr. Gardner's paper.—Ed. Journ. Bot.]

Although *Cotoneaster vulgaris* is widely distributed in the mountainous districts of Central Europe and of Asia, its only known habitat in Great Britain is upon the limestone ridges of the Great Orme's Head. Here it was first discovered in 1783 by J. W. Griffiths, of Garn (as recorded in Williams's *Faunula Grustensis*, published at Llanrwst in 1830). None of the early botanists who investigated the flora of Snowdonia and Wales seem to have visited our then out-of-the-way promontory. Thomas Johnson, who stayed at Bodysgallen in 1639, would certainly have recognized it had he seen it; for, as editor of the second edition of Gerard's *Herbal*, he describes the species from the Alps under the name of a "dwarffe kinde of medlar." John Ray was at Conway on a botanical tour in 1658, and again in 1662, but he apparently did not visit the Orme; neither did Dillenius, or Richardson, or Brewer, who all botanized in Wales in the following century; and the Rev. J. Lightfoot, who was at Gloddaeth about 1770, did not mention it among the rare plants he observed and recorded in the neighbourhood.* Subsequent to its discovery as above in 1783, William Wilson, of Warrington, wrote of it in 1821 as "plentiful on the three ledges of rock just above the Llandudno village," and also as "occurring on various parts of the headland."† In 1835 the Rev. Robert Williams, son of a former rector of St. Tudno, described it as "abundant" on the rocks above the mines at Llandudno.‡ In 1860 Mr. Peter Inchbald, of Huddersfield, described the "Creigafal" (which was its local name) as growing on the same ledges of rock, and also "plentifully on other parts of the Great Orme's Head." Not many years after this, however, the Cotoneaster's struggle for existence as a rare plant unfortunately commenced. In 1872 the Rev. W. S. Symonds alluded to it as having "become rare through the rapacity of collectors." Again, a few years later, Bishop Walsham How wrote of having to "poke about" among the privets and brambles to discover it, remarking that "visitors had

---

* Pennant's *Tours in Wales*, ed. 1810, vol. iii. p. 142.
† *Hortus Britannicus*, London, 1838; No. 40, 2713.
‡ *History of Aberconwy*, Denbigh, 1835, p. 159.

been cruelly destructive." This vandalism went on for many years, till in 1900 Mr. J. E. Griffiths described the *Cotoneaster* as "very nearly extinct." At the present day I much regret to say that it has been absolutely exterminated from its former head-quarters above the road to Tyn-y-Cae near the copper mines, as well as rooted out from nearly every other habitat upon the headland. In fact, it is probable that the wild examples of this interesting shrub in Great Britain have been reduced to three wretched stunted specimens, which with difficulty survive on bleak and out-of-the-way crags. . . .

Note.—Since the above paper was read, an exhaustive search upon the headland by Mr. R. W. Jones has increased the known wild specimens of the *Cotoneaster* to a total of nine. Though these all bloomed, they appear to have produced only five ripe berries between them. They were inspected periodically while in flower, but no insects were noticed upon them. Three specimens of the original stock living in gardens were watched intermittently while in bloom by Mr. R. W. Jones, Mr. R. J. Gresley Jones, Mr. L. S. Underwood, and the writer. They were visited by many wasps (*Vespa vulgaris* and *V. germanica*), once or twice by humble bees (*Bombus terrestris*), and frequently by flies of the genus *Musca*. One bush which flowered freely proved exceedingly attractive to *Musca Cæsar*; the blue-bottles literally swarmed upon its blossoms for a few days. This bush produced a plentiful crop of berries, while the other two had but few.

NOTES ON THE FLORA OF FLINTSHIRE.

By A. A. Dallman, F.C.S.

(Concluded from p. 77.)

Ligustrum vulgare L. Native on limestone, Coed Fawr, Meliden; on limestone road near Tremeirchion; limestone rocks above railway near Hendre Lime Works, between Rhydymwyn and Nannerch; limestone rock in wood by lake near Ysceifiog. A form with variegated leaves grows in a hedge south-west of Bagillt, but it cannot be regarded as native here.

Vinca major L. Ruins of Hawarden Castle, May 13, 1868, *Herb. Harris*. Hedgebank by ruined cottage near Glan-y-Morfa, north-west of Bodelwyddan.—*V. minor* L. Bank in lane immediately below Rhos-Isaf near Llanfynydd. No doubt originated from an adjoining garden.

Blackstonia perfoliata Huds. Near Caergwrle, July 31, 1872, *Herb. Harris*; Sealand, *S. G. Cummings*; Hope Mountain near Pont-y-Bodkin, *Drinkwater*; Moel Hiraddug; Craig Fawr; waste ground between mouth of Wepre Brook and Connah's Quay; between Caerwys and Llyn Helyg; eminence by coast near Rockcliff Hall; Marian, Cwm.

Gentiana Amarella L. By some lime kilns north of Moel Findeg; Craig Fawr; on common near Brynford; Moel Hiraddug;

field by railway below Nannerch. The flowers frequently show a small incision towards the base of the corolla tube; this is evidently the work of some insect which systematically visits the flowers for honey. Sometimes the perforation is lower down than usual, and extends through the calyx also. I am inclined to believe that self-fertilisation often occurs in the absence of insect visitors. Out of several flowering sprays which I gathered prior to anthesis, and kept in water behind a fine muslin veil in my room for some days, the majority appeared to set seed.—*G. germanica* Willd. The Graig, Tremeirchion.

Menyanthes trifoliata L. Llyn Du, in quantity; swamp between Gwern and Talwrn Glas, at about 1050 ft. In North Wales, Ffa gorsedd, as it is commonly known, is held in great repute on account of its supposed medicinal virtues.

Cynoglossum officinale L. The Graig, Tremeirchion.

Symphytum officinale L. By the Nant Brook above Pont Bleiddyn; by chapel between Sarn Mill and Waen Dymarch, Nannerch; between Greenfield and Glany don.

Anchusa sempervirens L. Roadside entering Holywell from Brynford.

**Myosotis scorpioides* L. (*palustris*). Along the Clwyd from Rhuddlan to Pont Ryffudd, Sept. 1909. Appears to be a very local species in the county.

Echium vulgare L. On limestone by the lake below Ysceifiog.

**Solanum rostratum* Dunal. A number of plants on furnace refuse close to Mostyn Quay, Sept. 1909.—*S. nigrum* L. On furnace refuse by Mostyn Iron Works.

**Lycopersicum esculentum* Mill. Waste ground near railway, north-east of Mold.

Hyoscyamus niger L. A number of examples were observed about Foel Farm, near Cwm, at Liverpool Botanical Society excursion in July 1909. About the farm below Dyserth Castle, *Day & A. A. D.*; one example near Mostyn Quay, 1909. A single stem was found to be covered with 127 small insects of various kinds. Are the viscid hairs of the henbane merely to protect the flower from unwelcome honey-stealers, as appears to be the case in *Silene nutans*, or do they indicate a possible insectivorous habit?

Verbascum Thapsus L. Bank adjoining and north of Padeswood Station; very fine on island in Elwy, *Day*; about the North Hendre Lead Mine and the lime works; on limestone in wood skirting the lake below Ysceifiog; Bryn Goleu near Nannerch; lane to east of Plas-on towards the Mold road; between Ffrith and Llanfynydd; between Afon wen and Sarn Mill.—**V. Blattaria* L. Two plants on island in Elwy, Sept. 1909, *Day & A. A. D.*

Linaria Cymbalaria Mill. Caergwrle, May 13, 1869, *Herb. Harris*; walls, Holywell; bank of lane south-east of Pentre Farm, Lixwm; Whitford; Bodelwyddan; near Pen-y-felin, near Nannerch; road near Bryn Bella, Tremeirchion; between Tre Mostyn and Trelogan; between Leeswood Hall and Llong Station; wall by road east of Tower, Mold.—*L. minor* Desf. (*viscida*). In fair

quantity, scattered among cinders in railway track about the sidings by the North Hendre Lead Mine, Sept. 1909.

Scrophularia aquatica L. Banks of Clwyd near St. Asaph.

Mimulus Langsdorffii Donn. Banks of Clwyd between Rhuddlan and St. Asaph; Elwy.

Veronica didyma Ten. (*polita*). Between Tyn twll and Plas Yw, at 780 ft.—*V. Tournefortii* C. Gmel. About Bodfari Station; near Leeswood; roadside between Afon wen and Sarn Mill; railway sidings, North Hendre Lead Mine.—*V. Anagallis-aquatica* L. Sealand, *New*; Rhyl, *Mason*; reservoir of lead works, Llannerch-y-mor; ditches about Capel Morfa near Bodelwyddan; ditch by Alyn near Mold; pond near Padeswood Station; ditch by lane below 'Marsh Inn,' Rhuddlan.

**Euphrasia curta* Wetts. The Voel (fide *Wheldon*).

Melampyrum pratense L. Plentiful amongst the heather on Hope Mountain; Gwern Mountain, at about 1100 ft.; wood above Waen Dymarch near Nannerch, at 500 ft.

Pinguicula vulgaris L. Swamp south of Moel Findeg; swampy ground north of road between Talwrn glas and Gwern, at about 1050 ft.

Verbena officinalis L. Roadside between Dyserth Castle and Gwaenysgor, *Day*; plenty on island in Elwy, *Day & A. A. D.*; Cwm; a weed in waste ground between Greenfield and Holywell; below a lime-kiln, the Graig, Tremeirchion; by a cottage known as 'The Temperance' by railway, Sarn Mill.

Mentha rotundifolia* Huds. Roadside in front of a cottage called 'Wern Bach,' above Caerwys.—*M. longifolia* Huds. (*sylvestris*). Near Caergwrle, *Herb. Potts*.—*M. piperita* L. Rhyl, *Herb. Potts*: Ysceifiog.—M. spicata* L. (*viridis*). A few plants by the bridge over Nant-y-Flint, below Maes gwyn mawr.—*M. aquatica* L. × *arvenis* L. (*M. sativa*). Rhyl, *Herb. Potts*; above Mount Farm, above Llanfynydd; Clwyd; island in Elwy just above junction with the Clwyd; by road between Ty Celyn and Plas-yn-Cwm.—*M. arvensis* L. Rhyl, 1842, *Herb. Potts*; Broughton, Aug. 25, 1869, *Herb. Harris*; cornfields about Dwlig-Isaf, south-east of Rhuddlan.

Lycopus europæus L. By the Clwyd between Rhuddlan and St. Asaph.

Origanum vulgare L. Small patch on embankment between Llannerch-y-mor and Mostyn; on common near Brynford; Ffynnon Beuno, *Stapleton*; between Mold and Cilcain; plentiful about Caerwys; on limestone in wood near Bron eirion, Ysceifiog; Graig, Tremeirchion. Frequent on the limestone; sometimes occurs with white flowers.

**Thymus Chamædrys* Fr. On the summit of Moel Hiraddug, Dyserth, *Miss L. R. Cooke*.

Clinopodium vulgare L. Common in limestone districts.

**Melissa officinalis* L. Occurs occasionally as an escape about old cottages, &c.

Salvia Verbenaca L. On the tumulus opposite Crugyn Farm south-east of Rhuddlan; below a limekiln, Graig, Tremeirchion.

Nepeta Cataria L. Extending along hedge on south side of main road, almost opposite Caerwys Station; hedge by Fyddion Farm south of Llyn Helyg, *Dr. W. R. Lee & A. A. D.*

Marrubium vulgare L. Ffynnon Beuno, *Stapleton*; Craig Fawr, Meliden; by Marl Cottage on road between Rhuallt and Cwm (mixed with *Ballota*).

Stachys palustris L. Sealand, *New*; on road from Dyserth to Cwm, *Miss Cooke*; near Capel Morfa between Rhuddlan and Bodelwyddan.

Leonurus Cardiaca L. On rubbish by Rhuddlan Foundry; roadside near Bryn Gwyn Villa between Caerwys and Bodfari; by ruined cottage by road north-west of Crugyn Farm, south-east of Rhuddlan.

Lamium amplexicaule L. Foot of wall by roadside opposite the Marine Lake, Rhyl.—*L. maculatum* L. Bretton Lane, *Thomas*; roadside, Whitford; by stream below Ysceifiog Church (in company with *Symphoricarpos*).—*L. Galeobdolon* Crantz. Hawarden Park, May 13, 1868, *Herb. Harris*.—*L. album* L. Caergwrle, May 13, 1869, *Herb. Harris*; Bretton, *Thomas*; roadside by cottage about half-way between Mold and Rhydymwyn; near Fron above Nannerch Mill; by Hafod-y-Cwm, south-west of Nannerch; between Nannerch and Waen Dymarch; about Broomfield Hall near Mold; Halkin (sparingly); Nannerch; Ysceifiog; large patch between Flint Castle and the Railway Station; close to the Police Station, Nannerch; west side of railway by footbridge above Mold; by a farm called Gelli about two miles west of Rhosesmor; between Penbedw uchaf and Nannerch.

Ballota nigra L. Sealand, *New*; Rhyl, *Mason*; about Rhuddlan; island in Elwy just above junction with Clwyd; outside Connah's Quay towards Northop; between Rhuddlan and Cwm; Bagillt; between Flint and Bagillt; roadside near Bodfari; one plant opposite Bretton Chapel; between Soughton and Mold; between Cilcain and Mold.

Teucrium Scorodonia L. Common along the lanes, hillsides, and hedgebanks in the grit district. The compact, crowded, unilateral inflorescence largely compensates for the small and not particularly conspicuous flowers. Insect visitors are numerous, the large lower concave lobe of the corolla affording a very efficient landing stage. The long stamens are hairy, while the short pair have glabrous filaments. Why is this? On Cwm Mountain I have noticed small moths visiting the flowers at dusk.

Plantago media L. Sealand, *New*; Tremeirchion; Moel Findeg.

Chenopodium ambrosioides* L. In fair quantity scattered about furnace refuse by Mostyn Iron Works and the Quay, Sept. 1909.—*C. rubrum* L. Mostyn Quay.—C. Vulvaria* L. A single plant on furnace refuse by Mostyn Quay, Sept. 1909. The nauseous odour of this plant appears to be due to the presence of dimethylamine ($(CH_3)_2NH$) or trimethylamine ($(CH_3)_3N$), or perhaps both. The amine is readily separated on distilling the plant with a moderately strong solution of sodium hydrate. The odour may perhaps serve to attract insects.

**Beta maritima* L. A large patch on the embankment of the Clwyd just below the railway bridge, Foryd, Aug. 5, 1909.

Atriplex portulacoides L. Between Greenfield and Mostyn.

Salicornia herbacea L. By Clwyd near Rhuddlan Church. Along the coast beyond Connah's Quay. In the latter district the plant is locally known as "Samkin," and is gathered and pickled for use as a condiment.

Suæda maritima Dum. Salt marsh about mouth of Clwyd. Along the coast from Saltney to Point of Air.

Polygonum Raii Bab. Rhyl, Aug. 1842, *Herb. Potts*.—*P. Hydropiper* L. Ditch by Alyn near Mold; banks of Clwyd; pool by Padeswood Station; near Mount Farm above Llanfynydd, at about 990 ft.—*P. lapathifolium* L. Kinnerton, *Herb. Potts*.—*P. amphibium* L. *β terrestre* Leers. Rhyl and Caergwrle, *Mason*; Llyn Du; ditch by road between Rhuddlan and Abergele.

Daphne Laureola L. Blacon near Chester, *Herb. Potts*. Wood by road west of Ty Celyn between Cwm and St. Asaph, *Day & A. A. D.*

Euphorbia Cyparissias* L. Kinnerton, *Herb. Potts*.—*E. Paralias* L. On a small patch of natural beach by the entrance to Mostyn Quay. A number of plants, Sept. 1909.—*E. exigua* L. Roadside south of Afon Goch.—E. Lathyrus* L. Between Sarn Mill and Ysceifiog, 1909. A garden escape.

Ulmus montana Stokes. Several large trees, at about 980 ft. elevation, by the old lane above Hawarden Waterworks, north slope of Moel Fammau.

Humulus Lupulus L. Hedge by Tyn twll near Nannerch, at about 520 ft.; east side of road below Caerwys; Bodfari; below Celyn Maly near Cilcain; hedge above railway, Dolfechlas, Rhydymwyn; Llong; hedges north-west of Crugyn near Rhuddlan; about the lead works, Llannerch-y-mor; lane leading from Caergwrle to Waen-y-llyn. Not uncommon in the Mold valley.

Parietaria ramiflora Moench. Trelogan; Whitford; Ysceifiog; Holywell; near Nannerch Mill; walls near Plas-on, Nerquis; Cilcain; Dyserth; between Christ Church and Leeswood Hall; about Rhuddlan; railway embankment between Foryd and Rhyl.

**Juglans regia* L. Several trees in hedge near Four Crosses, Cilcain, at about 640 ft., Aug. 1909.

Carpinus Betulus L. One or two stunted shrubs in a hedge by some tall beeches, about one mile from Flint towards Bagillt.

Castanea sativa Mill. Caergwrle, *Mason*; Llyn Helyg.

**Salix purpurea* L. By the Clwyd, south of Rhyd-y-ddauddwr.—*S. viminalis* L. By the Clwyd between St. Asaph and Rhuddlan.

**Populus alba* L. Between Walwen and Halkin, at about 800 ft.; by the Marine Lake, Rhyl (planted).—*P. alba* L. × *P. tremula* L.* (*P. canescens* Sm.). Lane between Mainwaring Farm and Saltney Station; by Clwyd near Rhyllon, St. Asaph; between Nannerch and Nannerch Mill; between Rhuddlan and Cwm.—*P. tremula* L. Pandy Lane, Dyserth, *Day*; lane between Pant Farm and the old Toll Bar on Holywell Road, east of Rhuallt; hedge near Hafod Dew, north of Ysceifiog; between Nannerch

and Nannerch Mill; near Hawarden Waterworks, north slope of Moel Fammau, at 980 ft.; near Cilcain; north of Moel Findeg; lane near Aelwyd uchaf above St. Beuno's College; near Tai Bowern, Christ Church; plantation by road below Hafod Llwyn, west of Rhuddlan; wooded bank on shore by Rockcliff Hall.—*P. nigra* L. Between Rhyd-y-Ceirw and Cae Hic, at about 900 ft.; by Clwyd between Pont-y-Cambwll and Pont Ryffudd. There are some very fine examples in places along the Clwyd, especially about St. Asaph.

Empetrum nigrum L. Still occurs in quantity on Gwern Mountain, whence it was recorded by Waring in 1772. I cannot confirm Waring's statement that it is confined to the driest parts of the mountain, after seeing the plant in this station. It appears about as plentifully in swampy ground and moist situations as in drier spots, and it is certainly not confined to the latter. It grows here at an elevation of some 1100 ft. Like the Cowberry this appears to be a very local species in Flintshire, being confined to a limited area close to the county boundary. I was unable to find it on the adjoining peak, Pen-elun-y-gwr.

Taxus baccata L. Hedges about Rhos Isaf and Tan-yr-Ywen, above Llanfynydd; a small shrub in hedgerow between Bryn Bella and Pont-y-Cambwll.

Larix europæa L. Above the Hawarden Waterworks on the north slope of Moel Fammau some larches appear to thrive at an elevation of about 1140 ft. Higher up the mountain, on the Denbigh side, there are a number of trees at some 1700 ft. elevation, the remains of an extensive plantation. These are very stunted, and large numbers have perished. In such a situation, which is very wind-exposed, and where transpiration is consequently much accelerated, while the soil is very scant, the evident struggle of the plant with the inhospitable environment affords a pathetic picture. The same thing is to be seen on Moel-y-Parc above Caerwys, where, at an elevation of about 1000 ft., some Scottish pines and larches eke out a precarious existence, numbers of prostrate trunks and decaying stumps testifying to the high and rapid mortality.

Elodea canadensis Michx. In the reservoir behind the lead works, Llannerch-y-mor; in the lake below Ysceifiog; in the Clwyd between Rhuddlan and St. Asaph.

**Listera cordata* Br. Moel Fammau, May 1835, *Herb. Potts.* In heathy ground in the woods skirting Llyn Helyg, in fair quantity on both sides of the lake, June 1908, *Day & A. A. D.* It occurs in the latter locality at an elevation of some 600 ft., which is in contrast to its higher range in West Lancashire (1100–1500 ft.). In Denbighshire it has been noted at an altitude of 1100 ft., but its range in this county has not been determined.—*L. ovata* R. Br. Sealand, *S. G. Cummings*; between Cwm and Llyn Helyg.

Helleborine atrorubens Druce. Found in fair quantity growing on the scar limestone, Moel Hiraddug, on an excursion of the Liverpool Botanical Society, 1909; the Leete; Moel Findeg. Some specimens in *Herb. Potts*, labelled "*Epipactis purpurata*,

near Rhyl," are probably this species.—*H. latifolia* Druce. Near Rhyl, *Herb. Potts.*

Ophrys apifera Huds. Sealand, *New & Cummings.*

Habenaria conopsea Benth. Heathy ground by roadside between Lixwm and Ysceifiog.

Narcissus Pseudo-Narcissus L. Ewloe Wood, March 31, 1869, *Herb. Harris.* Still there, 1908. Wood by Penbedw Hall near Nannerch.

Galanthus nivalis L. Hawarden Park, Jan. 27, 1869, *Herb. Harris.* Twice found on Dee Cop, *New.*

**Ruscus aculeatus* L. Wood by road west of Ty Celyn, between Cwm and St. Asaph, Sept. 5, 1909, *Day & A. A. D.* Probably planted.

**Asparagus maritimus* Mill. Sealand near Chester, *Herb. Potts.*

Allium vineale L. Sealand, *New.*

Tamus communis L. Reaches an elevation of 880 ft. on Bryn Goleu near Nannerch.

Narthecium Ossifragum Huds. Swampy ground on Gwern Mountain. What is the significance of the copious hairs of the filaments? The lower portion of the stamens of certain other swamp plants (e. g. *Anagallis tenella, Tradescantia virginica,* &c.) have similar hairs.

Juncus maritimus Lam. Rhyl, 1842, *Herb. Potts.*

Luzula pilosa Willd. The Leet.—*L. multiflora* DC. *β congesta* Lej. Caergwrle, *Mason*; near Cwm; above Nerquis.

Typha latifolia L. Pond to left of railway station, between Kinnerton and Broughton Stations; pool by railway below Mostyn Iron Works; in the reservoir of the lead works, Llannerch-y-mor; by Clwyd between Rhuddlan and Rhyd-y-ddauddwr; pond behind Connah's Quay Station; ditch by Dee embankment between Llannerch-y-mor and Mostyn.—**T. angustifolia* L. A large patch of *Typha*, which I believe was this species, was seen in the swamp on Gwern Mountain in Sept. last, but I was unable to collect it. This would be at an elevation of about 1100 ft.

Sparganium simplex Huds. Bretton Lane, *Thomas.*

Lemna minor L. Bretton, and near Bilberry Woods, Hawarden, *Thomas.*—*L. trisulca* L. Pond between Cwm and Rhuddlan, *Day & A. A. D.* The Duckweeds are rather local and uncommon in Flintshire.

Triglochin palustre L. The Cop; pond by Padeswood Station; near Bretton; pond near Llyn Helyg.—*T. maritimum* L. Along the coast from Saltney to Foryd.

Potamogeton polygonifolius Pourr. Llyn Du; swamp between Gwern and Talwrn glas.—*P. perfoliatus* L. In the Clwyd by Pont-y-Cambwll.—*P. pusillus* L. Pond between Cwm and Rhuddlan.

Ruppia rostellata Koch. Flint, *Herb. Potts*; ditch by embankment between Greenfield and Mostyn.

Scirpus maritimus L. Ditches below Ynys Farm near footpath to Rhuddlan; a small patch about a third of a mile past Golftyn towards Flint.—*β conglobatus* Gray. By Clwyd above Rhuddlan; pond by Hawarden Bridge Iron Works.—*S. pauci-*

florus Lightft. Rhyl, *Mason* (sp.).—*S. Tabernæmontani* Gmel. Pool below Mostyn Iron Works; ditch by Dee embankment near Walwen.

Carex vulpina L. Ditches on Morfa Rhuddlan; ditch by Dee embankment near Walwen.—*C. contigua* Hoppe (*muricata*). Ditch by Clwyd below Rhuddlan; between Mold and Cilcain; near Nannerch.—*C. leporina* L. (*ovalis* Good.). Caergwrle, *Mason* (sp.).—*C. caryophyllea* Lat. (*verna* Chaix). The Voel.—*C. distans* L. Rhuddlan, *Herb. Potts*.—*C. acutiformis* Ehrh. (*paludosa* Good.). Swamp by road near Glan-yr-afon, between Rhydymwyn and Nannerch.—*C. inflata* Huds. (*ampullacea* Good.). Llyn Du; swampy ground behind Nannerch.—*C. echinata* Murr. Near Cwm.

**Setaria viridis* Beauv. Waste ground near Mostyn Iron Works, Sept. 1909.

**Phalaris canariensis* L. Scattered about sidings, St. Asaph Station; waste ground by railway north-east of Mold; with other casuals by railway by North Hendre Lead Mines; lane side between the Cilcain Road and the "Factory Pool."—*P. arundinacea* L. Between Trelogan and Tre Mostyn.

Milium effusum L. Wood by Clwd near Melyn-y-Green.

Ammophila arenaria Lith. Beginning to colonise an arid and exposed sand spit in the Dee Estuary opposite Connah's Quay. A few clumps only, July 1909. The meagre vegetation of this sandbank affords an interesting ecological study. The sandbank is only of comparatively recent formation, and I only observed six other Phanerogamia growing on it. These were *Sedum acre*, *Sagina nodosa*, *Leontodon hirtus*, *Plantago maritima* and *P. Coronopus*, and *Ulex europæus* (this last on part of the bank where there was a little soil). It will be seen that these are all plants which possess marked xerophytic characters.

Aira caryophyllea L. Plentiful on the Voel.—*A. praecox* L. Caergwrle, *Mason*; Moel Arthur.

Trisetum flavescens Beauv. Rhyl, *Mason*; Cwm; near St. Asaph; Tremeirchion; Rhydymwyn.

Avena pubescens Huds. Whitford; near Cilcain; S.W. of Nannerch; Rhydymwyn.

**Kœleria gracilis* Pers. c *britannica* Domin. (*K. cristata*). Craig Fawr, Meliden; Moel Findeg; the Voel.

Glyceria aquatica Sm. Ditches on Morfa Rhuddlan; ditch, Bretton Lane.

Festuca rottbœllioides Kunth. Near Rhyl, *Mason* (sp.).—*F. rubra* L. Caergwrle, *Mason*.—*F. rigida* Kunth. Moel Arthur; Caergwrle; near Caerwys; Hope.

Bromus ramosus Huds. (*asper* Murr.). Lane in Bilberry Woods, Hawarden, *Thomas*; near Cwm; Caergwrle; Hope.—**B. secalinus* L. Near Hawarden Bridge Iron Works, Sept. 1909.—*B. unioloides* H. B. K. and **B. arvensis* L. With other casuals by the railway siding by the North Hendre Lead Mine near Rhydymwyn, Sept. 1909.

Lolium temulentum L. Siding by North Hendre Lead Mine.

Agropyron caninum Beauv. Near Hawarden Bridge Iron Works.—*A. junceum* Beauv. Rhyl, *Mason* (sp.); on the coast between Golftyn and Rockcliff Hall; on the shore below the North Wales Paper Works; embankment of Clwyd at Foryd.

Lepturus filiformis Trin. Plentiful along the coast between Connah's Quay and Flint.

Hordeum murinum L. Bretton Lane, *Thomas*; Rhyl; Dee Cop; between Higher Ferry and Saltney Station; roadside above Greenfield Station; waste ground between Wepre Brook and Connah's Quay.—*H. nodosum* L. (*pratense* Huds.). Fields between Rhyl and Rhuddlan; between Higher Ferry and Saltney; behind the 'Marsh Inn,' Rhuddlan.

**Elymus arenarius* L. In fair quantity on a small patch of beach by the entrance to Mostyn Quay, Sept. 1909; sandhills between Rhyl and Prestatyn, 1908.

Asplenium Ruta-muraria L. In crevices of the tower on the summit of Moel Fammau (alt. 1840 ft.) in company with *A. Adiantum-nigrum*. Plentiful on wall by roadside north-west of Caergwrle.—*A. Trichomanes* L. Moel Findeg.

Phyllitis Scolopendrium Newm. (*S. vulgare* Symons). Craig Fawr, Meliden; in crevices of wall on coast side of Rockcliff Hall.

Ophioglossum vulgatum. Moel Maen Efa above St. Beuno's College, alt. 800–900 ft., June 1908, *Rev. P. Stapleton*.

Equisetum limosum L. Llyn Du; pool by Padeswood Station. —*E. maximum* Lam. Wood below Bryn Goleu, Cwm, and Pandy Lane, Dyserth, *Day*; plentiful between Greenfield and Mostyn; near the cement works, Caerwys; Llanfynydd; between Trelogan and Tre Mostyn; between Pont-y-Bodkin and Pont Bleiddyn; by stream below Caegwyn, Tremeirchion.—*E. palustre* L. Swampy ground south of Moel Findeg; pool by Padeswood Station.

**Lycopodium clavatum* L. Moel Fammau, *Herb. Potts*. This might be in Denbigh, as one side of the peak lies in Denbigh, the county boundary passing over the summit.

Pilularia globulifera L. Mold, *Miss Potts*.

NOTES ON BRITISH CARICES.

By G. Claridge Druce, F.L.S.

The following notes have been made while looking through the very able monograph of the *Cyperaceæ-Caricoideæ* by Pfarrer-Georg Kükenthal, which appeared last year in Engler's *Pflanzenreich*.

Carex Pairæi F. Schultz = *C. echinata* Murr. Herb., not of Prod. Stirp. Gott. p. 76, 1770, *C. muricata* L. herb., vix Sp. Pl. This sedge, which I first reported as British from near Helston, in Cornwall, in this Journal for 1906, p. 32, appears to be of very local occurrence. I can now report it from near Woodchester, Gloucestershire, where I gathered it in 1900. The specimen was

recently submitted with the following plants to Pfarrer Kükenthal, who names it *C. echinata* Murray, the name which he employs for *C. Pairæi*, but which Mr. Britten (Journ. Bot. 1907, p. 163) has shown to be untenable for this plant. The species has evidently been much misunderstood, for C. B. Clarke has named the plant of Murray's herb. *C. muricata*; Townsend calls it *C. divulsa*, and Kükenthal *C. Pairæi*. It is not therefore to be wondered that Linnæus should put under the number representing his *C. muricata* a specimen of *C. Pairæi*, to which in an aggregate sense it doubtless belongs. Some immature specimens gathered by me at St. Aubin's, Jersey, are almost certainly also *C. Pairæi*, which is new to the Channel Isles.

C. Leersii F. Schultz, which Kükenthal puts under *C. echinata* (*Pairæi*) as a variety, I have gathered near Little Marlow, 1903, and Seer Green, Bucks, 1909.

C. binervis L. var. *Sadleri* Linton and var. *nigrescens* Druce. These are merged in var. *alpina* Drejer, Rev. Crit. 1841, p. 56, by Kükenthal.

C. Œderi Retz. var. *subglobosa* (Mielich. in Flora, xxii. p. 257, 1839, as a species) is reduced by Kükenthal to a form. I gathered it at Lough Neagh in 1898: forma *canaliculata* Callmé I found on the shores of Lough Neagh, near Toome Bridge, Co. Antrim, 1909.

C. lepidocarpa Tausch, kept as a full species in the monograph, is a common British sedge, and many of the records for *C. flava* will have to be transferred to it. Undoubted records for *C. lepidocarpa* are Weston-on-the-Green, &c., Oxford; Tubney, &c., Berks; Winslow, &c., Bucks; Kelmscott, 1885, Gloucester, E.; Charnwood Forest, Leicester; Ettrick Bridge End, Selkirk; Ben Lawers, M. Perth; Rescobie, Forfar; Altnaharra, Sutherland, W.; Loch Maree, West Ross; Loch Watton, Caithness; Mullaghmore, Armagh.

C. flava × *Œderi*. I have this from Ingleborough, York; Glen Fiagh, Forfar; Ben Laiogh, Argyll; Ben Heasgarnich, ref. no. 549, Ben Lawers, Mid Perth; Carr Bridge, Easterness; Glen Callater, S. Aberdeen; Cnochan, W. Ross. A specimen from Glen Callater is "perhaps *C. flava* × *lepidocarpa*."

C. extensa Good. var. *latifolia* Boeck. in *Linnæa*, 1877, p. 289, which Kükenthal calls var. *Ecklonii* in the *Pflanzenreich*, p. 677, 1909, was first found in Britain by Mr. Bailey near Portpatrick, Wigton. This year I gathered it in Ireland at Strangford Lough, Co. Down.

C. caryophyllea Laterr. forma *umbrosæformis* Kükenth. Glen Cahir, Co. Clare. It is the *C. præcox* var. *elatior* Bogenhard, Fl. Jena, p. 378, 1850.

C. flacca Schreb. forma *bulbosa* (Drejer). Canisp, and on sea-sand at Betty Hill, Sutherland, W. Kükenthal uses, but I think in error, the name *C. glauca*, which dates only from Scopoli's Flora Carn. ed. 2, ii. 223, 1772, not from Murray's Prod. Stirp. Gott. p. 76, 1770 (as given by Richter and Kükenthal), where, although Haller's description is cited, it is without the name *glauca*. Schreber's name, therefore, has priority.

C. aquatilis Wahl. forma *angustata* Kükenth. First found by the Rev. E. S. Marshall by the Spey, Inverness; I have also gathered it at Altnaharra, Sutherland, W.

C. Goodenowii Gay var. *tornata* (Fries) Kükenth. Cors Bodeilio, Anglesey, 1900; Loch Tummel, Mid Perth, &c.

Var. *strictiformis* (L. H. Bailey) Kükenth. Altnaharra, n. 1936, *E. S. Marshall*; Inchnadamph, Sutherland, W.; Toome Bridge, Co. Antrim.

Var. *recta* (Fleisch.) Kükenth. A rather common form in northern marshes. Otmoor, Oxford, 1885; Ashurst, S. Hants, *C. E. Palmer*; Feula Burn, Forfar, 1882; Methuen, Mid Perth; Arisaig, Westerness; Ben Hope, Inchnadamph, &c., Sutherland, W.; Loch Durran, Caithness; Toome Bridge, Co. Derry, 1898.

Var. *juncea* (Fries) Kükenth. = *C. juncella* Fries. A rather frequent form in Britain.

Var. *stenocarpa* Kükenth. Glen Fiagh, Forfar, first found by the writer in 1905; Tayside, Mid Perth; Llanberris, Carnarvon.

C. canescens × *stellulata* = *C. echinata* × *canescens* Hausskn. Canlochan, Forfar, *Ewing & Druce*; Ben Lawers, Mid Perth.

Forma *super-canescens* Kükenth. = *C. tetrastachya* Traunst. = *C. helvola* var. Druce in Rep. Bot. Exch. Club, 1897, p. 571. Ben Lawers, Mid Perth. This is a different gathering from the plant which Kükenthal names true *C. helvola* gathered by me on Ben Lawers, Mid Perth, and Loch na Gar.

C. vulpina L. var. *litoralis* Nolte. St. Ouen's Bay, Jersey; Breydon, Norfolk; Abersoch, Carnarvon; Strangford Lough, Co. Down.

C. divulsa Stokes. Beauport, Jersey; Sark, 1906; Wicklow, 1909.

"*C. divulsa* × *vulpina*." This hybrid was admitted to my List on the evidence of specimens sent to the Exchange Club in 1885 from Malvern, gathered by Mr. Towndrow as "*C. vulpina* × *divulsa*," 1885. Onə root only in a depression in some common land, growing with *C. vulpina*, *muricata*, *divulsa*, and *ovalis*. The Rev. E. F. Linton (Journ. Bot. 1907, p. 301) says "this was originally found by Mr. R. F. Towndrow at Newland, Malvern, Worcestershire, in 1889; one plant only, which died out. It did not attract much attention, perhaps through Babington referring it (Wats. B. E. C. Report) to *C. divulsa*, of which he said it had the nut. (With one of my specimens a piece of *C. divulsa* was attached, and this may have happened with the sheet submitted to the professor.) I have many specimens of this gathering, and fertile nuts are by no means easy to find; but there is very clear evidence of *C. vulpina* in the fruit. This hybrid was gathered later in July, 1902, Portskewett, Monmouth, by Messrs. Marshall and Shoolbred; and the specimens, though rather immature, are borne out by Mr. Towndrow's gathering." The above remarks by Mr. Linton do not accurately state the facts—*e. g.* the specimens were originally found in June, 1885, not 1889, and were sent to the Bot. Exch. Club in that year (see Report, p. 138), and it was in that Report that Babington said "it seems to have the nut of

C. divulsa, to which I should place it"; so the presence of a specimen of *C. divulsa* with Mr. Linton's sheet has nothing to do with Babington's remark, unless on the very extraordinary coincidence of *C. divulsa* being also present in specimens gathered four years before. It is true Mr. Bennett (Watson Exch. Club, p. 12, 1889–90) cites this statement of Babington, and says that Mr. Towndrow's specimen "has well-formed nuts, though not mature; these are not exactly those of *C. vulpina* or *divulsa*, they differ from *vulpina* by being broader, and the apex much stouter; from *divulsa* in being flatter, more tapered at the base, and also at the apex, the foliage is decidedly more gross than *divulsa*, more like that of *muricata*. . . . It is not easy to regard this plant other than a hybrid." I was very sceptical as to this plant being a hybrid, and quite as doubtful about the Portskewett specimen, of which my example was too immature and scanty to venture a decision. I have submitted the Malvern plant to Pfarrer Kükenthal, who reports it is not a hybrid but "*C. vulpina* var. *nemorosa* Rebent.," and it agrees with other specimens so named by him. The fruits, though young, are not, I think, sterile, but even on the same inflorescence show considerable variation in shape. In fact, two might be selected which would almost mark different species, but to me they are not like the perigynia of *divulsa*. But if one consults the drawing of the perigynium of *C. vulpina* in the *Pflanzenreich*, in Husnot's *Cyperacées de France*, and in Syme's *English Botany*, one will see very considerable difference in shape; indeed, Mr. Bennett's description does not well fit those on my specimen. It must be remembered that the fruits of *vulpina* are very apt to be galled, but I do not think this is the case with the Malvern plant. Babington, it must be borne in mind, speaks of the nut, not of the perigynium. Kükenthal is by no means unwilling to admit hybrid Carices, therefore his opinion on this point is of more weight. It seems that for the present we must question the occurrence of *C. divulsa* × *vulpina* for Britain.

C. inflata Huds. var. *brunnescens* (And.) Druce. Head of the Hunder Beck, York; Glen Callater, S. Aberdeen; Ben Laiogh, M. Perth, &c. The *C. rhynchophysa* of the Lond. Cat. is now identified with *C. utriculata* Boott. = *C. inflata* Huds. var. *utriculata* (Boott.), but Kükenthal uses *C. rostrata* Stokes, not *C. inflata* Huds. A plant from Altnaharra, Sutherland W., Kükenthal believes shows the presence of *C. vesicaria*, and that was my opinion at the time of gathering, but although I made a careful examination I could find no *vesicaria* near.

C. arenaria L. var. *remota*. Marss, near Brandon, Norfolk; Lydd, E. Kent; Betty Hill, Sutherland, W.; Wicklow sandhills, Ireland, forma *remota* Kükenth. Probably the *C. ligerica* Lond. Cat.

MARRAT'S COLLECTION OF BRITISH MOSSES.

By J. A. Wheldon, F.L.S.

Through the kindness of Dr. J. W. Ellis, of Liverpool, I have been permitted to examine a collection of mosses now in his possession, which was made by the late F. P. Marrat. It was obtained at the sale of his effects after his death, and probably represents a portion only of a general collection of plants. To Lancashire botanists the collection is an extremely interesting one, as it throws light on several doubtful and obscure records which have troubled local bryologists.

The specimens are mostly small, and glued down, but Dr. Ellis was good enough to allow me to detach portions for critical examination when necessary. Most of them seem to have been collected between the years 1849 and 1852, but dates as well as collectors' names are frequently omitted from the labels, and the localities are sometimes not very precisely defined. The older botanists were not always careful to retain the original labels, and therefore, although in every case these in this collection are in Marrat's neat but microscopic handwriting, one cannot be sure that the specimens were all collected by him. From the evidence of the specimens themselves it is probable that some were collected by William Wilson and John Nowell, with whom he corresponded, and others by Yorkshire botanists. The incomplete data with some of the specimens render them less generally useful than they might have been if accompanied by full details of collection. A large proportion of the local specimens are in good fruiting condition, from which it would appear that the districts around Manchester and Liverpool were fifty years ago much more favourable for the development of Mosses than they are now. On the majority of the specimens no comment is necessary, but I have inserted in the following list such as are from additional stations to those given in the local Floras, or are of general interest for various reasons.

Sphagnum molluscum Bruch. Stansfield Moor. Rainford Moss, May, 1849. This latter appears to be a new county record (v.-c. 59).—*S. Girgensohnii* Russ. A specimen from the Sidlaw Hills, Forfar, is labelled "*S. fimbriatum.*" Probably collected in 1848, which is the date given for other specimens from this district.—*S. acutifolium* R. & W. This was, hitherto, unrecorded for South Lancashire. Marrat's specimen was collected on Rainford Moss, but it has not been observed there in recent years.—*S. subnitens* R. & W. Sidlaw Hills. New to v.-c. 90.

Andreæa petrophila Ehrh. var. *gracilis* B. & S. I refer to this a slender reddish plant, labelled by Marrat "*A. alpina* Hed., a curiosity found on Ben-na-Boord, Forfar, July, 1844." It is new to v.-c. 90.

Oligotrichum hercynicum Lam. Fruiting examples from "Rooley Moor, near Manchester."

Pleuridium subulatum Rabenh. Bebington, Cheshire.

Swartzia montana Lindb. I expressed doubt as to the probability of this plant occurring on Rainford Moss in this Journal for 1898 (p. 134), and this is justified by a specimen in this collection, which is only a form of *Campylopus flexuosus* labelled "Rainford Moss, May, 1851." It bears fully ripe capsules, the setæ of which are less flexuose and more erect than in the young plant. When Mr. Travis and I recently found *S. inclinata* near Rainford, we thought this might have been Marrat's plant, but these specimens prove that such was not the case. Moreover, there is a good example of *S. inclinata* in the collection from the Sands of Barrie, which would no doubt have enabled Marrat to recognise it, had he found it in the district. It is very satisfactory to have this old doubtful record cleared up and definitely expunged from the South Lancashire list.

Fissidens adiantoides Hedw. Fruiting examples from Oxton Heath, Cheshire, April, 1852.—*F. osmundioides* Hedw. Langfield Moor, Todmorden, *J. Nowell.*—*F. incurvus* Starke. Gillbrook, Cheshire, January, 1850. This is probably the moss placed doubtfully under *F. tamarindifolius* in my "Mosses of Cheshire," Journ. Bot. 1898, p. 305. If so, the specimens were collected by Skellon, and they cannot be referred to *F. tamarindifolius* as now understood.

Grimmia apocarpa Hedw. Fruiting examples from "Wall near the Catholic Chapel, Garston, March 7th, 1852."

Rhacomitrium fasciculare Brid. Fine fruiting plants from "near Walton Tunnel, March, 1852." Long extinct in this locality.—*R. canescens* Hed. var. *ericoides* B. & S. Strensall Moor, N. Yorks. Only one station is given for this variety in Mr. Slater's list of mosses in the *Flora of N. Yorks.*—*R. heterostichum* Brid. Fruiting specimens from Bidston Hill, February, 1852. Prior to seeing this I had examined only one Cheshire specimen, collected at Gayton by *Dr. Ellis.*

Trichostomum mutabile Bruch. In fruit, from New Brighton, Cheshire, April, 1851, but labelled "*Tortula tortuosa* Hedw."

Weisia microstoma C. M. Near Leasowe Castle, Cheshire, January, 1852.

Tortula ruralis, in fruit, from Crosby Sandhills, February, 1850, proves, as was anticipated, to be *T. ruraliformis* Dixon. Fruiting specimens are so very rare on these dunes now, that it has never been observed in that condition (although frequently looked for) during the last twenty years!—*T. aloides* De Not. Railway bank at Roby, Lancashire, 1852 (labelled *T. rigida* Eng. Bot.). Also under the name of *Tortula rigida* Linn. there is a specimen of *Tortula brevirostris*, but unfortunately no locality is given for this rare species.

Splachnum ampullaceum L. Ainsworth Moss near Manchester, 1851, fruiting.

Tetraplodon mnioides B. & S. Rainford Moss, May, 1849, fruiting.

Cyrtodon splachnoides Br., localised from Loughrigg, Westmorland, June, 1852, proved on examination to be only a form of

Dicranella squarrosa. On the same sheet was mounted a specimen of *Octoblepharum albidum*!

Funaria fascicularis Schimp. Ganthorpe Moor near York, 1846.—*F. Templetoni* Sm. Banks of the Irwell, near Manchester, 1851.

Paludella squarrosa Ehrh. A fine tuft from Terrington Carr, Yorkshire, October, 1867. Mingled with it are a few stems of *Camptothecium nitens* and *Mnium affine.* It is labelled *Bryum squarrosum* Hedw.

Bartramia Œderi Swartz. Manchester, 1850. This on examination proves to be *B. pomiformis*, which is itself sufficiently rare as a South Lancashire plant to render this old record interesting.

Webera albicans Schimp. Fruiting examples from Sailor's Shore, Pilkington, 1851.

Bryum Marratii Wils. Singularly enough, this is represented by a very poor specimen from the Sands of Barrie!—*B. atropurpureum* W. & M. Leasowe Castle, Cheshire, 1852, and Brickfields, North of Liverpool, March, 1850.

Fontinalis capillacea Dicks. "In a small stream running into the river Thames." Two specimens appear on this sheet, one of which is a *Philonotis*, the other (a single stem) a *Fontinalis* resembling *F. squamosa.* There is nothing resembling *Dichelyma capillaceum* B. & S., a very doubtful British species.

Cryphæa heteromalla Brid. Kimmerley Park, Norfolk, February, 1846.

Plagiothecium denticulatum B. & S. var. *obtusifolium* H. & T. The plant under this title from "hedgebanks, Bootle, near Liverpool, 1848," is only a form of the type. No doubt Skellon's plant was something similar. The doubtful record for v.-c. 59 in the Census Catalogue of British Mosses must be expunged. The variety only occurs in mountainous districts, and is quite distinct from lowland plants which have frequently been erroneously referred to it.

Brachythecium salebrosum B. & S. var. *palustre* Schimp. There are two Yorkshire specimens of this in fruit, under the name "*Hypnum salebrosum* Hoff." One is from Stockton Forest, and the other from Sutton, 1854. Neither of these stations is quoted in "*North Yorkshire.*"—*B. plumosum* B. & S. Bidston Hill, Cheshire, February, 1852.

Eurynchium Swartzii Hobk. Fine fruiting examples from near Croxteth Hall, South Lancs., January, 1852. They are labelled *Hypnum velutinum* L.—a singular error, as the long-beaked lids are conspicuously present!

Hypnum Kneiffianum Schimp. Old Moss Quarry, West Derby, December, 1849. The specimen under this label is *Drepanocladus polycarpon* Bland f. *acanthoclada* Moenk. = *H. aduncum* var. *pungens* Auct. Ang.—*H. fluitans* Linn. This is represented by three forms, which may be named as follows:—1. *H. fluitans* var. *Jeanbernati* Ren. f. *condensata* Sanio. Near Manchester. 2. *H. fluitans* var. *Jeanbernati* Ren. Swamps on Bidston Hill,

Cheshire. 3. *H. pseudo-fluitans* (Klinngr.) Warnst. Crosby Sandhills.—*H. stramineum* Dicks. Near Manchester. The specimen is in fruit, and is probably from Prestwich, from which locality it was recorded by Percival.

Hylocomium triquetrum B. & S. Fine fruiting specimens from New Brighton Sandhills, Cheshire, 1849.—*H. brevirostre* B. & S. Castle Howard Woods, 1847. There is no record for the Howardian tract in Mr. Slater's list of North Yorkshire Mosses.

WILLIAM HILLHOUSE
(1850–1910).

William Hillhouse, who until recently occupied the Chair of Botany at the University of Birmingham, was one of the first professors appointed to the Mason Science College at Birmingham, his appointment dating from April, 1882. For the brief period between his retirement in September 1909 and his death at Malvern on January 27th, he had resided at Malvern Wells, hoping thereby to benefit his health, which of late years had been somewhat precarious. He was buried at Malvern on Jan. 31st.

He was the son of John Paton Hillhouse, and was born at Bedford on December 17th, 1850. He became an assistant at the Bedford Modern School, and whilst there took up the study of the Bedfordshire flora. On his return from a visit to Norway he assisted in the founding of the Bedfordshire Natural History Society, and was largely instrumental in bringing together material for a new *Flora of Bedfordshire*, which however was never published. In 1876 he became a Fellow of the Linnean Society.

In 1877 Hillhouse determined to give more time to the study of Botany and went to Trinity College, Cambridge, where he became a scholar in the following year. From 1878 to 1882 he was assistant curator of the University Herbarium. During this period he became a member of the Cambridge Philosophical Society, and was appointed University Lecturer in Botany. He was also made Lecturer in Botany at both Girton and Newnham Colleges. His sojourn in Cambridge was signalised by the birth of the *Cambridge Review*, of which he was a co-founder and co-editor with Prof. Arnold, of Bangor, and Vice-Principal Dale.

During the first year of his tenure of office at Mason College, Hillhouse went over to Bonn to work in the laboratory of Prof. Strasburger. This visit resulted in the translation of Strasburger's *Practical Botany*, which, under their joint authorship, has reached its sixth edition. In 1888 Hillhouse was made chairman of the Academic Board of Mason College, and largely by his efforts a University Extension Movement was established in connection with Birmingham.

Hillhouse took an active part in educational work in the Midlands. He had been president of the Birmingham Natural History Society, and the King's Heath, Bearwood, and Moseley Institutes, and for some years up to 1909 he represented the

University upon the Leicestershire Education Committee. As honorary secretary of the Birmingham Botanical and Horticultural Society, and subsequently as its chairman, he did much to make the Botanical Gardens, Edgbaston, one of the most delightful places in the Birmingham district, and the alpine garden, which he designed and assisted to construct, is one of the finest and boldest pieces of rock-work in any provincial garden. He was also chairman of the Council of the Midland Reafforesting Association.

His own published botanical work was comparatively small in amount, but his unfailing kindness and enthusiasm endeared him to all the students who passed through his department. Many of his old students owe much to his sympathetic appreciation of their early work, and by these and numerous other friends and colleagues his death will be sincerely regretted.

G. S. West.

SOME NEW JAMAICA ORCHIDS.—IV.

By W. Fawcett, B.Sc., F.L.S., & A. B. Rendle, D.Sc., F.R.S.

(Continued from Journ. Bot. 1909, p. 266.)

Polystachya minor. *P. foliosa* Griseb. Fl. Brit. W. Ind. 628, (partim) non Reichb. f. *Viscum delphinii flore minimum* Sloane Cat. Jam. 120; Hist. Jam. i. 251, t. 148, f. 3. Caulis robustus, longiusculus, leviter compressus, vix anceps, basi 5-vaginatus, inferne, 2–5-foliatus, superne squamis scariosis paucis elongatis acuminatis acutisve arcte adpressis dorso carinatis vestitus. Folia majuscula, oblongo-ligulata, multinervia, apice paullo attenuata oblique emarginata, basi longe vaginantia, et cum vagina articulata. Racemus simplex aut leviter ramosus, ramis subsecundis, brevibus, angulatis, vix puberulis. Bracteæ minutæ, ovato-triangulares, acuminatæ vel subulato-acuminatæ. Flores minuti, sessiles vel subsessiles; alabastra oblique ovoidea, apice abrupte acuta. Sepala carnosula, apiculata, 3-nervia; medianum ovato-ellipticum; lateralia satis longiora, leviter obliqua, triangulari-ovata; mentum paulo prominens. Petala lineari-subspathulata, acuta, sepalo mediano æquilonga vel vix breviora. Labellum, lobis lateralibus parvis, rotundatis, infra labelli medium oriundis; lobo mediano multo majore, rotundato-elliptico, apiculato; margine leviter crispulato; disco furfuraceo-puberulo; callo ad basin, conico, prominenti.

Plant 1·5–3 dm. high. Pseudobulb ·5–2 cm. l. Leaves 7–20 cm. l., 11–25 mm. br. Raceme 1 to nearly 3 dm. l. Bracts 1·5 mm. l. Flowers yellowish-white. Sepals median, 2·5–2·7 mm. l., 1·5 mm. br.; lateral 3 mm. l., 2 mm. br. Petals 2·5 mm. l. Lip about 3 mm. l., median lobe 2 mm. br. Column (incl. anther) about 1 cm. l. Capsule 6–8 mm. l.

Hab.—On trees; in flower and fruit, Sept.–Jan.; Red Hills between Spanish Town and Guanaboa, *Sloane*, H. S. iv. 124! Fairfield, *Wullschlaegel*, 1055 (partly)! J. P. 523, *Morris*! near Brown's Town, *Miss T. M. Barrett*! Claremont, 1700 ft., *Fawcett & Harris*! Lancaster, 2200 ft.–3000 ft.; Belvedere, Hanover, 500

ft., *Harris* ! below Guava Ridge, *Fawcett* ! Fl. Jam. 7568, 7777, 7805, 10,434.

Distribution.—French Guiana.

Differs from *P. foliosa* Reichb. f. in being a larger plant, with larger flowers, also in floral details, especially in the petals and lip ; the conical projecting callus at the base of the lip is very characteristic.

Trichophila jamaicensis. Pseudobulbum anguste cylindraceum, vix tumidum. Folium lineare, subteres, longe acuminatum. Scapus folio plurimo brevior, laxe 3-florus. Bractei elliptico-oblongi, acuminati, ovario longiores. Sepala 3-nervia cum nervulis paucis undulatis pinnatis, lateralia lineari-lanceolata, leviter conduplicata, carinata, mucronata ; medianum 4-nervium leviter reticulato-nervulosum, ligulatum, acuminatum. Petala, nervis ut in sepalis lateralibus, sepalo mediano similia sed paullo breviora atque latiora. Labellum ambitu late ovato-ellipticum, subcochleare, obscure 3-lobatum, apice abrupte acuto, inferne saccatum, margine denticulato-eroso, petalis breviora, disco ad basin duobus sacculis instructo. Columna clavata, ad clinandrii basim dente parvo instructa; clinandrium cucullatum, margine superiore truncato eroso ; stigma depressum, cavi margine rotundato.

Plant 15–18 cm. high. Pseudobulb 1–2 cm. l., about 2 mm. br. Leaf 11–17 cm. l., about 4 mm. br. Scape about 2·5 cm. l. ; sheath nearly 2 cm. l. Bracts 10–14 mm. l., about 4 mm. br. Pedicel and ovary 7–10 mm. l. ; pedicel of fruit ·5 cm. l. Sepals, lateral 19 mm. l., barely 2·5 mm. br. ; median 17 mm. l., 2·5 mm. br. Petals 16 mm. l., 3 mm. br. Lip 14 mm. l., about 10 mm. br. Column 5 mm. l., clinandrium 2·5 mm. l. Capsule (unripe) 1·5 cm. l., 5–6 mm. br.

Hab.—On trees, in flower Sept. ; Mansfield, near Bath, and cultivated at Castleton Garden, 7697, *Harris* !

Near *T. mutica* Reichb. f. and *T. hymenantha* Reichb. f. The type specimen of *Macradenia mutica* Lindl. (*T. mutica* Reichb. f.) in herb. Lindley at Kew has shorter and broader and less acuminate sepals and petals (measurements are : lateral sepals 16 mm. l., 3 mm. br., median 15 or nearly 16 mm. l., 3·2 mm. br. ; petals 15 mm. l. ; lip 11·5 mm. l., ovary and pedicel 15–17 mm. l.) ; and his sketch of the column does not show the lateral teeth found in the Jamaica plant. The measurements of Reichenbach's type of *T. hymenantha* at Kew are : sepals 25 mm. l., petals 20 mm. l. ; lip (acuminate), 17 mm. l.

Dichæa Morrisii. Caules pauci, simplices, longiusculi, robusti, compressi. Folia longiuscula, membranacea, oblongo-ligulata, apice rotundata et breviuscule apiculata, margine integerrima superne microscopice ciliata, inferne articulata ; vaginis longis, compressis, carinatis ; limbo caduco, patenti, basi leviter attenuato et brevissime conduplicato. Sepala æquilonga, late ovato-oblonga, longe acuminata, margine ciliata. Petala sepalis similia, sed minora. Labellum album, carnosulum, sessile, inferne longe, angusteque cuneatum, superne valde dilatatum, ancoriforme, margine ciliatum, apice apiculato recurvato, lobis lateralibus

longiusculis, retrorsis, triangulari-subulatis. Columna brevissima, crassa. Capsula ellipsoidea, densissime longeque setulosa.

Plant to 45 cm. l. Stems 4 mm. br. Leaves, limb 3·5–4 cm. l., 1·1–1·3 cm. br., median nerve prominent below, lateral nerves 20–25 on each side, very thin; sheath about 2·5 cm. l. Sepals about 13 mm. l., about 7 mm. br., median narrower. Petals 11 mm. l. Lip about 9 mm. l. Capsule about 1·5 cm. l., 1 cm. br.

Hab.—On trees, Mt. Moses, 3500 ft., J. P. 2269, *Morris*! Hardware Gap, *G. Nicholls*!

Allied to *D. anchorifera* Cogn., from Brazil, which differs in the smaller size of the flowers, in the shape of the sepals and petals. in the shape and width of the leaves and length of sheath, and in the much smaller capsule. It is named after Sir D. Morris, who first discovered it.

Maxillaria rufescens Lindl. var. **minor**, var. nov. Herba minor, floribus dimidio minoribus.

Hab.—On trees and rocks; in flower Aug.–Nov.; Mt. Moses, 2500 ft., J. P. 2009, *Syme*! Mabess River, 3000 ft., *Harris*! Fl. Jam. 7615.

Distribution.—Cuba, Tropical America.

Plant 15–20 cm. high. Pseudobulbs 3 cm. l., 1·3 cm. br. Leaves 8–18 cm. l., 1·1–2·2 cm. br. Peduncles about 2 cm. l.; pedicel and ovary together 2·5–3 cm. l. Sepals, lateral about 1 cm. l., 4·5 mm. br.; median 1·1–1·3 cm. l., 4·5 mm. br. Lip 8·5–10 mm. l., terminal lobe about 3 mm. br. Column 7–9 mm. l.

This var. differs from var. *flavida* Reichb. f. (Ref. Bot. ii. t. 79) in the flowers being much smaller.

In examining material in connection with our work we noticed that Lindley had included under *Stelis ophioglossoides* Sw. no. 1025 of Schomburgk's collection in British Guiana (Hook. Lond. Journ. Bot. ii. 670, 1843). The specimen, however, under that number in Herb. Mus. Brit. is quite unlike Swartz's specimen. It differs also from the three species known from Roraima, viz. *S. tristyla* Lindl., *S. grandiflora*, Lindl., and *S. guianensis* Rolfe, and from *S. Heylidyana* Focke (Surinam) and *S. zonata* Reichb. f. (Guiana). It may be described as follows :—

Stelis Schomburgkii. Caules dense cæspitosi, erecti, 1-articulati. Folia satis coriacea, lineari-ligulata, apice obtusa, basi in petiolum longe attenuata, caulibus longiora. Racemi solitarii, usque ad basin densiusculi multiflori, floribus secundis, foliis subæquilongi, basi spatha inclusi. Bractei ochreati, deltoidei, obtusi, ovario breviores. Sepala brevius connata, subobovato-ovalia, apice obtusa, dorso non carinata, trinervia, nervis liberis. Petala obovato-rotundata, apice vix carnosula, subtruncato-rotundata. Labellum carnosulum, oblongo-cuneatum, zona antica semicirculari apice obtuse atque brevissime apiculato.

Plant 12–14 cm. high. Stem 4–7 cm. l., 1 mm. thick. Leaves, including petiole, 6–10 cm. l., 6–8 mm. br. Racemes 5–8 cm. l.; spathe 6 mm. l. Bracts 1–1·5 mm. l. Sepals 1·5 mm. l., 1 mm. br. Petals ·45 mm. l., ·6 mm. br. Lip ·75 mm. l., ·45 mm. br.

Hab.—Roraima Expedition, Brit. Guiana, Schomburgk, n. 1025.

SHORT NOTES.

Mr. E. M. Holmes has issued the twelfth and concluding fascicle of his *Algæ Britannicæ Rariores Exsiccatæ*, with an accompanying list which may be worth reprinting on account of the localities given. For this reprint Mr. Holmes has corrected two or three small errors which appear in the original issue. Where not otherwise indicated the specimens were collected by Mr. Holmes.

Acrochæte parasitica Oltm. on *Saccorhiza bulbosa* De la Pyl. Swanage, May, 1909, *A. D. Cotton.*—*A. Alariæ* Born. Portrush, 1904, *J. Adams.*—*A. virgatulum* Thur. Padstow, August, 1905.—*Anabaina torulosa* Lagerh. Torquay, September, 1908.—*Callithamnion tetricum* C. Ag. Torquay, September, 1907.—*Callymenia Larteriæ* Holmes. Combe Martin, 1906, *Miss C. E. Larter.*—*Codium elongatum* C. Ag. Clare Island, July, 1909, *A. D. Cotton.*—*Colpomenia sinuosa* Derb. et Sol. Torquay, September, 1907, and Studland, 1908.—*Dermotolithon adplicitum* Fosl. Plymouth, March, 1909 (dredged).—*D. pustulatum* Fosl. Torquay, September, 1908.—*Ectocarpus acanthophorus* Kuetz. Torquay, September, 1908.—*E. microspongium* Batt. Plymouth, *G. Brebner*, September, 1896, and Hele, 1903.—*Endoderma viride* Lagerh. On *Nitophyllum Hillie* Grev. Torcross, 1899.—*Fucus inflatus* Vahl. Lerwick, Shetland, June, 1908, *W. A. Russell.*—*Gomontia polyrhiza* Born. & Flah. Fairlie, September, 1891.—*Grateloupia filicina* C. Ag. Padstow, August, 1905.—*Leathesia crispa* Harv. On *Chondrus crispus* Stackh. Swanage, June, 1908, *A. D. Cotton.*—*Lithophyllum incrustans* Fosl. Torquay, September, 1908.—*L. racemus* Fosl. Falmouth, 1906.—*Lithothamnion fruticulosum* Fosl. Falmouth, 1908.—*L. Sonderi* Hauck. Arran, May, 1903, *Mrs. D. Robertson.*—*Monostroma crepidinum* Fosl. Pagham, April, 1892.—*Myrionema reptans* A. D. Cotton, MS. Swanage, November, 1908, *A. D. Cotton.*—*Nitophyllum Bonnemaisonii* Grev. Combe Martin, October, 1906, *Miss C. E. Larter.*—*N. Gmelini* Grev. Torcross, August, 1899.—*N. Sandrianum* Zan. Padstow, September, 1906.—*Oncobyrsa marina* Rab. Swanage, September, 1897.—*Oscillatoria margaritifera* Gom. Torquay, September, 1908.—*Peyssonelia rupestris* Crouan. Plymouth, November, 1908 (dredged).—*Polysiphonia sanguinea* Zan. Studland, April, 1889.—*Ptilothamnion Pluma* Thur. Swanage, September, 1895.—*Rhododiscus pulcherrima* Crn. Plymouth, November, 1908 (dredged).—*Rhodophyllis appendiculata* J. Ag. Torcross, September, 1899.—*Schizymenia Dubyi* J. Ag. Falmouth, May, 1896.—*Sphacelaria tribuloides* Menegh. Dunbar, August, 1895.—*Sterrocolax decipiens* Schm. Sennen Cove, August, 1897, *C. J. Park.* Combe Martin, August, 1907, *Miss C. E. Larter.*—*Trailliella intricata* Batt. Plymouth, *G. Brebner*, October, 1895. Gosport, December, 1896, *H. H. Sturch.*—*Vaucheria sphærospora* Nordst. Weymouth, September, 1893.

Helleborine atroviridis in Ireland, &c.—Last summer, in looking through my herbarium specimens of this genus, I came

across a sheet collected in bud at Killarney, on June 28th, 1902, by Messrs. R. W. Scully, W. A. Shoolbred, and myself, and referred at the time to *E. media* Bab. (Fries, *pro parte*?). They agreed so well with the figure and description of *E. atroviridis* in the *Flora of Derbyshire*, p. 270 (1903), that I wrote to Mr. Scully, who happened to be on the spot, and on August 27th he sent me good fresh material, some of it still in full flower. It is locally plentiful on limestone. A dried specimen was sent to Rev. E. F. Linton, who replied:—"The Killarney plant appears to agree well with *E. atroviridis* W. R. L. by your description of the flowers, and by the gradually lessening size and narrowing of the leaves upwards. How about your Ardskinid, Tongue Bay, plant of 23, 7, 1900, the flowers of which you noted were 'green, scarcely tinged with pink'? It looks like *ovalis*; but with those flowers (and gradually decreasing narrowing leaves) it should be *atroviridis*. Not *latifolia*!" On examining my No. 1900 from the same station (108 W. Sutherland), collected on August 3rd, 1897, I find that it is just like the Little Doward, 36 Hereford, *E. ovalis* Bab. (*pro minori parte*!), which, last April, Rev. A. Ley and I agreed was an exact match with authentic *atroviridis*. In Bot. Exch. Club Report for 1898, Mr. Arthur Bennett expressed his agreement with Rev. W. H. Purchas that the Little Doward Hill specimens were not *E. atrorubens*. In 1907, Rev. W. R. Linton informed me that the Matlock "*atrorubens*" was really his *atroviridis*, adding that the figure of the latter in his *Flora* was too coarsely drawn. This is clearly the case; the flowers, in particular, are represented as a good deal larger than in any examples which I have seen. It follows that the Tongue Bay *E. atrorubens* × *latifolia* has only *latifolia* as one parent in a somewhat aggregate sense; it may more correctly be named *Helleborine atrorubens* × *atroviridis*. These two species are strikingly different when growing. Two examples which I collected in 1895 with Mr. Shoolbred, on limestone, in the woods below the Wynd Cliff, 35 Monmouth, are only in bud; but I feel pretty sure that they, too, must be called *H. atroviridis*. We noticed that in this case the rhizome was horizontal. Besides the leaf-characters, *H. atroviridis* differs from *H. latifolia* in the basal bunches of the labellum being plicate; it is broader than long, with a subrecurved tip, whereas the labellum of *E. media* Bab. is described as being longer than broad.—E. S. Marshall.

Outlawed Generic Names.—The proposal of Dr. Janchen greatly to amplify the list of generic names, sought by the Vienna Botanical Congress to place beyond the pale of the law of priority, is interesting as indicating to what lengths the abandonment of principle may readily go when once encouraged, and what a state of chaos is likely to ensue before very long unless this arbitrary method is rejected and a return made to the standard supplied by priority of publication, re-enforced by the designation of type species. We already begin to see evidences of a recognition of the necessity for the method by types both as to species and as to genera, and authorities who have had no clear conception of its

significance are intuitively mentioning types in an encouraging way. Now why not come to this method, and all agree on principles for designating types? In case any method adopted leads to destructive historical results in a few cases, then agree to assign types in these few cases which will leave the generic names in essentially their present significance. Thus we may substitute for the present proposed arbitrary method a constructive philosophical one, and reach results which will have a much better chance for permanency. Absolute rigidity in classification, and therefore in nomenclature, is unattainable and undesirable; generic limitations cannot appeal in just the same way to any two conscientious investigators, and originality is to be encouraged. I suggest that an international commission be appointed at the Brussels Botanical Congress to consider the principles applicable to the selection of generic types, and to submit, later, a list of published genera with type species determined and assigned.—N. L. Britton.

Callitriche intermedia Hoffm. var. tenuifolia. — Mr. Arthur Bennett has a valuable note in Bot. Exch. Club Report for 1908, p. 187, on a plant (my No. 3252) from Inchnadamph, 108. W. Sutherland. The synonymy is there given as follows:— *C. tenuifolia* Pers. (1805), *C. autumnalis* var. *Goldbachii* Kuetz. (1832), *C. angustifolia* Hoppe ex Koch, *Synopsis* (1837), *C. hamulata β homoiophylla* Gren. & Godr. (1848), *C. hamulata* var. *tenuifolia* Lönnroth (1854). In Proc. Roy. Soc. Edinb. p. 973 (1905), Mr. G. West calls it "a dominant plant" in the Loch Ness area; and I can state, from my own observations, that this is true of the Highlands generally, where it occurs in lakes and swift streams, and especially in mountain tarns, up to fully 3000 feet. It may be briefly described thus:—"Planta delicatula. Folia cuncta similia, submersa, anguste vel angustissime linearia, læte sed vulgo pallidius viridia." Mr. G. Goode has gathered it in the Welsh mountains; the only southern specimen seen by Mr. Bennett is from Earlswood Common, Surrey.—Edward S. Marshall.

Beta maritima in S. E. Yorkshire. —I cannot find any record of this plant for v.-c. 61. A specimen, however, exists in the Herbarium of the Holmesdale Natural History Club, Reigate, labelled "Scarborough Castle," but unfortunately without date or collector's name. The example appears to have been collected fifty or more years ago, and it would be interesting to know if the species still survives in the same spot.—C. E. Salmon.

West Lancashire Mosses.—In March of this year we found *Grimmia orbicularis* Bruch and *Pottia bryoides* Mitt. in the Silverdale district. The former occurred in considerable abundance on a limestone scar north of Challan Hall, and the latter on Castlebarrow. Both are new records for the vice-county.—J. A. Wheldon and A. Wilson.

A Correction.—In my *Viola* note (p. 80), *Reichenbachiana* should be *Riviniana*. In the dried plant, at least, as Mrs. Gregory

has pointed out, the spur resembles *V. Riviniana*; so the parentage may perhaps be *V. hirta* × *Riviniana*, rather than *sylvestris*. I feel practically no doubt as to the participation of *V. hirta*.—Edward S. Marshall.

REVIEWS.

The Craftsman's Plant-Book : or Figures of Plants selected from the Herbals of the Sixteenth Century, and exhibiting the finest examples of Plant-drawing found in those Rare Works, whether executed in Wood-cuts or in Copper-plate Engravings. Arranged for the use of the Decorator, with supplementary illustrations and some remarks on the use of Plant form in Design. By Richard G. Hatton, Hon. A.R.C.A. (London). 4to, cl. pp. ix, 539. London: Chapman & Hall. 1909. Price 25*s.* net.

If a man only lived long enough he would doubtless find that all his ideas which were worth anything would in time be carried out, sometimes by himself but more often by somebody else. To put it another way, it must be within the experience of everyone to find that, while he has been thinking how best to carry out some pet scheme, some one has been before him and put it into execution. Of this the very handsome volume which forms the subject of this notice is an example. For many years the present writer has thought and spoken about the desirability and possibility of producing within reasonable compass a selection of the more beautiful and interesting plant-figures of the sixteenth century; but while he has been talking and dreaming, Mr. Hatton has been working and acting, and the result is this in every way admirable collection.

The work which it had been my ambition to make more widely known was the *Historia Stirpium* of Leonhart Fuchs, a folio volume published at Basle in 1542, of which Mr. Hatton has made abundant use in the book under consideration. It is not a very rare book, and copies of it, or of its German translation published a year later, are from time to time in the market at quite reasonable prices—I think I gave two guineas for mine a few years ago; but it is certainly not as well-known as its merits deserve, for when I used to show visitors to the Department of Botany some of our more interesting and beautiful volumes, I never failed to dwell specially upon this work of Fuchs and to find that most folk were unacquainted with it. William Morris drew much of his inspiration from Fuchs, whose book he regarded as the best of all the herbals for refinement of drawing; Mr. Hatton points out that the figures, which he rightly terms magnificent, "are in outline only, for Fuchsius would not permit any shading lest the form should be confused, and the lines are cut to an unusual narrowness." If it would not seem ungrateful for what has been admirably done, one would regret that in Mr. Hatton's book the figures, which in the original

work are twelve or thirteen inches in length, have had to be reduced; but although this a little detracts from their beauty, their accuracy remains unimpaired.

In certain particulars these figures have, I think, never been surpassed by any subsequent artist. They combine to an unequalled extent artistic beauty and botanical accuracy—the truth with which the habit of each plant is conveyed is one of their most remarkable features. Fuchs's especial aim was to give in every case a complete life-history of the plant; hence you will find that the flower is usually represented in all its stages, from early bud to ripened fruit, and the leaves are in various degrees of unfolding. This sometimes produces an effect which at first seems somewhat odd; in the bramble, for instance, reproduced by Mr. Hatton on p. 202, the right-hand side of the plant represents the flower and leaves in a young state, while the left has branches with fruit and flowers all much reduced. However necessarily reduced, the whole plant is usually given, including the root; beautiful examples of this reduction are the Red Currant and Gooseberry (pp. 228, 229), on both of which flower and fruit exist synchronously; the representation of a complete Oak-tree in the limits of a folio or (as here, p. 412) a quarto page is distinctly quaint, as about half of the figure is bare stem. And although accuracy is never sacrificed to artistic effect, the latter is attained with remarkable skill; notice, for example, the Bottle Gourd (p. 223), where the large fruit quite naturally forms the centre of the drawing, the stems and branches forming exquisite curves. The artists are at their best in their studies of climbing plants; the two plates of the Ivy—one of the barren and one of the flowering and fruiting state—and of the Clematis—the last reproduced by Mr. Hatton on p. 52—are wonderful studies in arrangement. In the original the names of the plants are printed on the plates, and even this detail is so planned as to produce an artistic effect. One of the pleasantest features of the book is the presentment not only of the author, who, in his forty-first year, meets us at the beginning of the volume, but of the two artists and of the engraver, who, in their best clothes, occupy a page at the end of the volume. "Albertus Meyer is drawing the plant on paper; Henricus Fullmaurer is drawing upon the block from a drawing, perhaps one of Meyer's." One cannot fail to perceive that Vitus Rudolphus Speckle, the engraver, has executed his own portrait with more loving care than he has bestowed upon those of his colleagues or even upon that of his employer; the vigour of execution is Dürersque—one almost looks for "A.D." in the corner of it. A word must be said as to the typography of the book, which, especially in the German (black-letter) edition, is very beautiful. In every respect, indeed, this *Historia Stirpium* may rank among the finest productions of the sixteenth century press, whether regarded from the standpoint of science, art, or typography.

Mr. Hatton thinks "the figures in Fuchsius look as if they want colouring," but in this I cannot concur with him; he may, however, be right in supposing that in many herbals "it was

intended they should be coloured and issued in that form by the publisher." Certainly old copies are often coloured, but, as he says, "the colour is often put on carelessly and the form is obscured." As his frontispiece Mr. Hatton reproduces four good examples from a coloured copy of Bock's *Kreüter Buch* (1546); it is interesting to note that the figure of the Peach contains leafless flowering and fully-leaved fruiting branches on the same tree, on the principle already referred to.

Although the reproductions of Fuchs's figures are to my mind the most beautiful designs in the book, there are many others of nearly if not quite equal excellence. Such are those from Matthiolus (1565) from among the larger, and from Camerarius and Gerard (Tabernæmontanus) among the smaller—the enlargements of some of the Gerard blocks are not, I think, very happy; and in the appendix the remarkably bold figures by Egenholf (circ. 1550), and the etchings from Columna's Ecphrasis (1604). Many other books, all good in their way, are laid under contribution, the latest (and by far the poorest) being Lindley's *Vegetable Kingdom* (1845), the blocks for which "were done by a process called glyphography"; some are by "the compiler," as Mr. Hatton modestly styles himself, and these in their way are very good.

In the interest attaching to the figures I seem to have overlooked the text of the book, nor has its arrangement, which is that of the natural orders as generally adopted before the advent of the *Pflanzenfamilien*, been mentioned. The earlier portion is occupied by six chapters, dealing respectively with the old herbals, the use of plants in design, Jacobean floral ornament, considerations governing the use of plants in design, and the general form and classification of plants. Each subject is treated in a manner at once clear and scholarly; Mr. Hatton is evidently as well acquainted with the literary as with the artistic aspect of his subject. A short sketch of the characteristics of the natural orders is prefixed to each; a reference is given with each figure—there are more than a thousand of them—to the work from which it is taken and the page on which it is to be found; and there is a very good index. When it is added that the book is excellently well printed on good paper and suitably bound, it will have been made clear that the volume is in every way a most satisfactory production, appealing alike to the artist and the student of literature.

JAMES BRITTEN.

Report of the Botanical Exchange Club for 1908: by the Editor and Distributor, W. BELL, Esq., Knighton Road, Leicester. 8vo, wrapper, pp. 329–466. Oxford: James Parker & Son. 1909. Price 2*s.* 6*d.*

THE Report of the Exchange Club for 1908, issued towards the end of last year, is more bulky than its predecessors and contains, as usual, an amount of interesting and at times contradictory matter; those who wish for examples of the differences of opinion which may prevail among experts will always find

them in the pages of this Report. The increase is in part due to the addition to our lists of forms separable from the type only by characters of infinitesimal value, the differentiation of which must be to a large extent matter of opinion. A good deal of space is, to our mind, wasted in the discussion of trivial or personal matters—for example, the note on *Matricaria suaveolens*, where Mr. Druce and Mr. Riddelsdell discuss whether this is worth sending to the Club, and Dr. Vigurs's note on *Fumaria occidentalis*. The number of long communications, sometimes occupying several pages, increases; we should have thought that these would be more useful, as being more available for reference and discussion, were they printed in this or in some other journal. The Report appears under the name of Mr. W. Bell "editor and distributor" for the year; but a large part, including preliminary matter, which now embraces reviews, lengthy botanical notes, and obituaries, is by Mr. Druce. That indefatigable botanist also contributes a long list of "additional desiderata which are also additions to the British Plant List," *i. e.*, Mr. Druce's *List of British Plants*, to which this seems to be a supplement. This, as it appears to us, is entirely out of place, and, as it stands, is even meaningless; it implies the possession of a copy of the *List*, without which it is unintelligible; here is a specimen:

"474 bis *G. collinum* Steph. Eur. or. [Wilts].
478 × **Robertianum.**
494 minor Rouy & Fouc.
genus 123 bis *RUTA* [Tourn.]. L. Sp. Pl.
514 bis *graveolens* L. Eur. [Leith].
529 bis *L. linifolius* Roth. Eur. mer. [Leith].
561 bis *T. radiata* Boiss. Eur. [Yorks.] (= *Pocockia*)"

and so on for four pages. Whether Mr. Druce is justified in thus making use of the Report is of course a matter of opinion, and if Editor and the Club do not object, probably no one has a right to complain; but it is a farce to call such a list one of "desiderata," consisting as it does largely of corrections and comments upon a work in which the Club is in no way concerned. That even here Mr. Druce finds an opportunity for the creation of new combinations will surprise no one who knows his energy in that direction. The Report itself, although nominally edited by Mr. Bell, is annotated throughout by Mr. Druce, who incidentally discusses points of nomenclature, and answers comments that have been made. He has also two pages of notes on the Report for 1907, given now because he was out of England during the printing of that issue; among these we detect a new variety of *Ballota nigra*, "characterized by its larger, softer velvety leaves and laxer habit, which may be distinguished as var. *membranacea*."

Although the Report is so extensive, there are fewer paragraphs than usual which are of sufficient general interest for quotation. One or two of the longer notices we may, perhaps, reciprocating the compliment by which this Journal is laid under contribution, reproduce when space allows; for those on such

critical generaa as *Viola*, *Rubus*, *Rosa*, *Hieracium*—the last two occupy nearly six pages each—*Euphrasia*, *Mentha*, and *Carex*, reference must be made to the Report itself. We must content ourselves with the following :—

"*Stellaria graminea* L. Cottenham Park Road, near Raynes Park, Surrey, 19th June, 1908. Examples sent to show the dimorphism that exists in this species. The two forms may be found in most situations frequented by *S. graminea*, and occurring patches are very evident to the eye, as they are distinguished by their larger or smaller flowers. The one with the larger flowers is the hermaphrodite form, and the one with the smaller flowers is functionally a female form. Form 'A,' hermaphrodite, has flowers with petals quite one-third (or even twice) as long as the sepals; stamen 10 in number, with filaments long and of equal length; anthers reddish at first, afterwards deep brown in colour, pollen bearing, and styles as long as stamens. Form 'B,' feminine, is marked by flowers with petals shorter than (or equalling) the sepals; stamen 10 in two series, with filaments dwarfed, five longer and five shorter; anthers light brown in colour, pollen not formed; styles very prominent, exceeding sepals, petals, and stamens.—C. E. Britton."

"*Galium erecto-verum*. Wood Walton Fen, Hunts., Aug. 1908. Gathered with E. W. Hunnybun. Its occurrence here was a special feature of interest, inasmuch as it must have convinced the most sceptical disbeliever in hybrids that such do occur in nature. We have on one side *G. verum* in plenty, and on the other a form of *G. erectum* Huds. A complete change of intermediates could be seen, in which the flowers varied from pure yellow to white, through all the shades; and again the leaves showed all gradations from those of *erectum* to those of *verum*. I may say that the intermediates were more frequent than the parent *erectum*.—G. Claridge Druce. I see nothing against this determination, though the specimen before me is a poor one; it seems nearer *G. verum*. The correct name is *G. erectum* × *verum*; the alternative, *erecto-verum*, being contrary to the usage adopted by the Vienna Congress.—E. S. Marshall."

"*Sagittaria heterophylla*, Pursh, var. *iscana*, Hiern. River Exe, Exeter, Aug. 1908. See *Journal of Botany*, 1908, p. 273. In some considerable quantity, close to the children's playground, on the muddy margin of the River Exe, at Exeter. It also grows in several large patches near the bridge; but I was unable to see any in the river *above* the paper mill. *Mimulus Langsdorfii* also occurs in the stream. As to the manner of introduction into the Exe of this North American species, one can only, at present, conjecture. I found that American wood pulp has been used at the mill, and heard that American logs had been brought to the river at Exeter; whether the seeds came with them we have no evidence. It is evidently not of quite recent origin, although I suspect it is a very rapid grower. Unfortunately at the date I gathered it no trace of flowering stalks were visible; but on the principle that 'half a loaf is better than no bread,' I have ven-

tured to send leaves only. These, as it will be seen, resemble *Alisma Plantago-aquatica* more than those of our native *Sagittaria*, and have undoubtedly misled the local botanists, who failed to notice this alien in their midst. The very succulent leaf-bases were not promising subjects for drying-paper. — G. Claridge Druce."

A History of Botany, 1860–1900. By J. Reynolds Green, Sc.D., F.R.S. 8vo. pp. 543. Oxford: Clarendon Press. 1909. Price 9*s.* 6*d.* net.

The task of writing a continuation of Sachs's well-known *History of Botany* was albeit an onerous yet an enviable one—it was to be the historian of the most active and progressive period in the history of botanical science. This period, the beginning of which was almost coincident with the publication of the *Origin of Species*, has seen the rise and development of modern Botany. The publication of the results of Hofmeister's researches on the Cryptogams about the same time was perhaps as important for botanical science as the refutation of the doctrine of the constancy of species and the far-reaching consequences of the new point of view were for biological science generally. The destruction of the barrier between Cryptogams and Phanerogams made possible the conception of a gradual evolution of the great plant-groups, and a considerable quota of the work of the period in question has grown out of Hofmeister's discovery of the similarity, indicative of affinity, between the course of life-history in the various great groups. In 1860 Cytology, as now understood, was non-existent, and plant-physiology in a very unsatisfactory state. One of the great advances of the period has been the conception of the plant as a living entity reacting to its environment, and the great preponderance of physiology in the subject-matter of Dr. Green's book is to some extent an index of the growth of this branch of botany and of the importance it has come to occupy in the minds of workers. A feature of the period in question, which has also added considerably to the difficulty of the task, has been the vast increase in the number of workers and the almost innumerable memoirs which have had to be dealt with, as contrasted with the few great works which characterized the earlier period. Dr. Green has, however, thought it best to adhere closely to the lines of Sachs's original work, and the subject-matter is therefore divided into three Books dealing respectively with Morphology, Anatomy, and Physiology. These are preceded by a general introduction—a useful *résumé* of the condition of the science at the beginning of the period and of the progress in the various fields of study during the forty years over which it extends.

Book I., Morphology, comprises chapters on the nature of Alternation of Generations—an interesting account of the battles between the "homologous" and "antithetic" partisans, and in this as in other connections it must have been difficult to stop short at the end of the century; the theory of metamorphosis and

the gradual development of modern views of morphology; the morphology of the flower; taxonomy—a concise but very condensed account of the work of the period; and palæobotany, which has played so important a part, especially in the latter part of the period in question. Book II., Anatomy, comprises three chapters. The first, The Cell, is the history of development of Cytology; the Differentiation of the Tissues and the Study of the Cryptogams are the subjects of the other two. Dr. Green is naturally more at home in plant physiology, and Book III., which deals with this aspect of the science, occupies about one half of the entire volume. It includes eleven chapters which form an excellent *résumé* of work of the period. At the end of the book there is a useful bibliography of works to which reference has been made in the text. As a whole the new History of Botany is a careful, well-written, and eminently readable account of the progress of botany from 1860 to 1900, and should rank as not the least useful of Dr. Green's numerous and valuable contributions to botanical literature.

A. B. R.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on February 17th, 1910, Mr. W. T. Saxton gave an account of his recent investigations upon the anatomy of the genera *Widdringtonia* Endl. and *Callitris* Vent. Evidence was brought forward to show (1) that *Widdringtonia* and *Callitris* do not conform to the "*Cupressineæ*" type; (2) that *Widdringtonia* cannot be merged in the genus *Callitris*, but must rank as a distinct genus. (1) The chief points in which these two genera differ from the *Cupressineæ* are as follows:—(*a*) the position of the archegonia. In *Cupressineæ* these are found at the apex of the prothallus, in *Widdringtonia* and *Callitris* never at the apex; (*b*) the multinucleate prothallus cells; (*c*) the development of the proembryo. Eight free nuclei are formed in these genera and the proembryo fills the archegonium; (*d*) at least three embryos may be formed from a single proembryo. *Callitrineæ* was suggested as a tribal name to include these two genera (possibly also *Actinostrobus* and *Tetraclinis*). (2) Both morphological and anatomical differences were pointed out between *Callitris* and *Widdringtonia*, which seem more than sufficient to warrant the retention of *Widdringtonia* as a separate genus. Of the morphological differences the more important of those brought forward for the first time were:—(*a*) In *Widdringtonia* about sixty-four potential megaspore mother cells are formed at the base of the nucellus. In *Callitris* about two such cells are found, half way up the nucellus; (*b*) the number and arrangement of the archegonia differ materially in the two genera; (*c*) the microsporophyll normally bears four sporangia in *Widdringtonia*, three in *Callitris*. Of the anatomical differences the most important is the occurrence of thickenings of the cell-wall in connection with the bordered pits in both the wood and the transfusion tracheids of *Callitris*; these are not found in *Widdringtonia*.

Mr. George Massee, F.L.S., followed with a lantern demonstration of his researches on the Evolution of Parasitism in Fungi. To understand clearly the evolution of parasitism it is important to grasp a fundamental point in the evolution of fungi generally. The most primitive forms were aquatic, and reproduced by zoospores which necessitated the presence of water to secure their dispersion. As the fungi gradually took possession of dry land, a second asexual or conidia form of reproduction, suitable for dispersion by wind, &c., was gradually evolved. This supplementary conidial condition is always the form that has assumed a parasitic condition, the older sexual phase remaining as a saprophyte and developing when the host is exhausted. Parasitism is mainly the outcome of opportunity, and the fact that fungi present all stages of parasitism, and that a saprophytic fungus can be educated to become a parasite, proves that parasitism is an acquired habit. Incipient or imperfectly evolved parasites promptly kill the host, and consequently curtail the period of their own existence, as *Pythium Debaryanum*. A higher stage of parasitism is reached by many of the rusts and smuts, *Ustilago avenæ*, &c., where the host is attacked as a seedling, and is stimulated to an unusual condition of growth throughout its normal period of growth. More advanced parasites show a tendency to arrest the production of spores and conidia, and to perpetuate themselves by perennial mycelium located in some perennial vegetative portion of the host (root, tubers, &c.) or in the seed. In the most highly evolved parasites reproductive bodies are entirely arrested, and the parasite is perpetuated by hybernating mycelium only.

The S.P.C.K. has brought out a new issue—the "thirty-second edition"—of *Flowers of the Field* (7*s.* 6*d.*)—a reprint of the revised edition by Mr. Boulger, with the addition of sixty-four coloured plates, mostly selected from those in Mr. Henslow's *British Wild Flowers*, which was noticed in our last issue. The effect is not altogether good, as many of the plants were already figured in the book, and it looks rather absurd to have two pictures each of Clematis, Columbine, Evening Primrose, &c., facing one another. The book furnishes one more instance of the unwisdom of producing such a work without submitting it to a botanist, though even an ordinary observer might notice that the two plants figured and named as *Geranium pratense* cannot be identical—the coloured one is *G. sanguineum*. The two Roses, if rightly named, are not characteristic; the plant called *Scabiosa succisa* is *Jasione montana*; "*Aster Tripolium*" is not that species, as we pointed out on p. 85, and "*Calamintha officinalis*" is *Salvia verticillata*; the lettering of the two plates labelled respectively "*Colchicum autumnale*" and "*Crocus sativus*" has evidently been transposed: the uncoloured figures of each are correct, but the merest tyro can see at a glance that they do not correspond with the coloured ones. The same carelessness or ignorance is found in the list of coloured plates, where we have Chrysanthemum s*a*getum, Antirrhinum Oront*um*, Rubus Cæsius, Papaver Rh*æ*as; Scabiosa arvensis does not "face"

p. 360, but faces the title. It seems to us discreditable that so wealthy and important a Society as the S.P.C.K. should send out a publication so unsatisfactory; the body of Mr. Boulger's edition, as we said when reviewing it on its first appearance, is excellent, but the additions have not improved it.

It is not only the S.P.C.K. which fails to reconcile religion and science: the rival body, established in the interest of another aspect of Anglicanism, is equally unsuccessful in its attempts in that direction. We open the pretty and cheap little volume on *Children's Flowers* (1*s.* 6*d.*) issued by the Religious Tract Society, and find a coloured frontispiece labelled "Primrose, Daisy and Harebell." The Primrose is a Cowslip, the Daisy is not characteristic, there are, indeed, two or three small Harebells, but conspicuous though unmentioned are two pink flowers, one of which seems to be a Buttercup which has gone wrong in colouring. This creates an unfavourable impression which, it is fair to say, is to a large extent removed by the letterpress—we cannot say much for the other (uncoloured) plates. We are inclined to think it is by no means a new book; there is an old-fashioned air about the picture initials and the publishers put no date on their titlepage—always a suspicious sign!—but so far as the botany goes, Mr. (?) S. L. Dyson has done his work very well. About two dozen common plants—daisies, buttercups, dandelions, clover, and the like—occupy as many chapters, and are described in simple language fully and accurately, and in an interesting style: the book, in fact, is really suited to those whom its title indicates, and may be cordially recommended to those who do not object to the copious introduction of religious—and we fear we must add, rather forced and false religious—sentiment. To "look from nature up to nature's God" is right enough, but to tell children that forgetmenots "are glad to be beautiful and are thinking how good it was of God to make them so" (p. 69) is nonsense. This kind of thing defeats its object, and mars a pretty and useful little book.

We have more than once called attention to the unsatisfactory condition of some of the gardens under the charge of the London County Council, and the appointment—almost the last act of the "Moderate" majority of the last Council—of a military man to the post of Chief Officer of the Parks Department does not lead us to expect any improvement. Major Enthoven by his own admission knows nothing about landscape gardening or forestry or the laying out of parks, and we are not surprised that his appointment has evoked severe criticism, not only in the horticultural but also in the daily press, as well as from Progressive members of the Council. We hesitate to endorse the phrase "cold and calculated jobbery," which has been applied to the transaction, but we are utterly at a loss to understand on what ground it can be justified, and still more to imagine why those who can perpetrate such absurdities should claim for themselves the title of "Municipal Reformers."

Pages 49-56 cancelled — according to note [illegible]

near *Rubiginosæ* in its characters, from which it differs by its prickles, its much earlier white flowers, its smooth peduncles, &c. This species occupies a very extended space, and if it were a hybrid, as Mr. Schultz considers, one would be surprised to find it more abundant than its parents."

Déséglise has five sheets in his herbarium, of which four come from the same station near Bourges, in Central France. Two of these have been marked "*vidit* Boreau." The main prickles in some are hooked and stout, but less so and only curved or declining in others. The minor armature in very abundant area in those specimens with large hooked prickles, well marked off therefrom, but in others the prickles are mixed and of all sizes, while one has all its armature weak and slender. Leaflets 7, small and broadly oval, very rounded at apex, rather deeply and fully biserrate, glabrous above, slightly hairy beneath chiefly on midrib, and densely glandular. Petioles glabrous or nearly so, densely glandular with many very small prickles or acicles. Stipules usually broad, always glandular on back, auricles very variable in form, usually acuminate or lanceolate, but sometimes quite broad and deltoid. Peduncles solitary, rarely two, short, quite smooth. Fruit smooth, rather large, broadly ovoid, tendency to urceolate, but in one specimen quite obovoid, it is always quite globose when young. Sepals spreading or reflexed at first, ultimate erect and somewhat connivent, a good deal pinnate not glandular on back, though gland-ciliate, persisting till at least September. Styles cannot be seen.

There is no doubt about this being a *pimpinellifolia* × *rubiginosa* hybrid, the typical form of which has not been found in Britain, but forms very near it have been gathered at Boxley Warren, E. Kent, and by Mr. Barclay at Caputh, E. Perth. These differ primarily in their glandular aciculate peduncles, fruit, and sepals, which latter also are more entire, and the armature is more completely mixed, like that of *R. pimpinellifolia*. The flowers of the Boxley plant are rose, not white as in the type. I do not know the colour of the Caputh specimens.

Though these may be sufficient grounds for giving a varietal name to our British form, I hesitate to do so. Great variation must be expected in hybrids, and the naming of several different forms has already given rise to great confusion in the *pimpinellifolia* × *tomentosa* group.

Rosa involuta var. Nicholsonii

Crépin in Bull. de la Soc. Roy. de Bot. de Belg. xxi. p. 119 (1882).

"Leaflets of medium or rather large size, broadly oval or suborbicular, perfectly glabrous above, midribs a little pubescent, and secondary nerves a little pubescent, or glabrous, with numerous glands spread over the whole lower surface; teeth very glandular-compound. Outer sepals with 1 to 4 appendages. Flowers two. Branches and branchlets densely setigerous."

I have seen no specimen of this, so can only supplement

Crépin's description by quoting Mr. N. E. Brown's note on Nicholson's type from Suppl. to Eng. Bot. p. 133:—"Branches rather densely covered with straight aciculi and setæ. Leaves with glandular petioles and 5 to 7 elliptic or suborbicular obtuse leaflets, $\frac{5}{8}$–$1\frac{1}{8}$ in. long, $\frac{1}{2}$–1 in. broad, glabrous above, glandular all over beneath, and pubescent on the midrib, the teeth gland-ciliate. Flowers 1–3 together. Peduncles $\frac{1}{2}$–$\frac{3}{4}$ in. long, densely covered with rather long glandular setæ; calyx-tube subglobose or ellipsoidal, more or less gland-setose. Outer sepals sparingly pinnatifid, glandular on the back. Gathered at St. Cyrus, Kincardineshire."

So far as the above descriptions are concerned, I cannot see how this variety differs from var. *Moorei*, except in being much more densely armed, and perhaps its more fully biserrate leaflets. I think both are *pimpinellifolia* × *rubiginosa* forms.

Rosa lævigata var. Moorei

Baker, Monogr. Brit. Roses, p. 207 (1869).

"Prickles stouter than in any of the other forms, the largest 5 to 6 lines long, slightly curved, the scar $\frac{3}{8}$ in. deep. Leaflets nearly naked above, thinly hairy and densely glandular beneath, the serration like that of *Smithii*, the petiole scarcely at all hairy, but densely glanduloso-setose and furnished with numerous unequal aciculi, the large ones decidedly falcate. Flowers one or more, both peduncles and tube densely aciculate and glanduloso-setose. Largest sepals 8–9 lines long, slightly pinnate.—Recedes from the type (by its prickles and leaves glandular beneath) towards some of the *Rubiginosæ*, but yet evidently belongs here."

Had it not been for the great kindness of Mr. F. W. Moore, who lent me Dr. Moore's type-specimen from the Glasnevin Herbarium, I could have given no notes on this interesting hybrid. Mr. Baker has written a full description on the sheet containing the specimen, which was gathered in the parish of Tamlaghbard, on the shores of Lough Foyle, Derry. It was as follows:—"Bush two to three feet high. Prickles unequal, the largest about $\frac{3}{8}$ in. long, moderately robust below, slightly curved. Leaves 2–3 in. from base to apex of terminal leaflet, which is elliptical or typically ovate, and measures about $\frac{3}{4}$ in. long by $\frac{1}{2}$ in. broad. Leaves dull brownish green, and very nearly naked above, paler and thinly hairy all over beneath, and rather thickly sprinkled with viscous glands, the serration sharp and moderately connivent, the main serrations furnished each with two or three sharp gland-tipped teeth, the petiole scarcely hairy but densely setose, and furnished with numerous very unequal aciculi, the largest of which are falcate. Stipules very slightly glandular and not hairy on the back, closely setoso-ciliated. Flowers single or more than one, the peduncles densely aciculate and setose, the calyx-tube subglobose and more or less prickly, the sepals $\frac{3}{4}$ in. long, leaf-pointed, densely glandular on the back, truly persistent, mostly simple, but

the more luxuriant ones with a pinna on each side.—I cannot tell whether this is more like *Sabini* or *rubiginosa*. The prickles and leaves look very like those of the latter, the calyx is rather that of the former. It comes very near in some respects the French *R. biturigensis* Bor., but this has naked peduncles, fruit, and sepals."

I can add but little to the above. The prickles are sometimes quite straight, sometimes decidedly curved. They are stout, but not abnormally so, much like those of *R. gracilis*, and the specimen shows no acicles, but an example on another sheet, with no locality mentioned, has decidedly stouter prickles with a few acicles. The leaflets are elliptical rather than ovate, and more acute than is usual in *pimpinellifolia* hybrids. Mr. Baker's "rather thickly sprinkled with viscous glands" is a better description than his "densely glandular" of the Monograph. I can see very little resemblance to *R. biturigensis*.

Mr. Marshall's No. 813, from between Beauly and Lentram, E. Inverness, labelled var. *Nicholsonii* Crép. by him, belongs here from its very stout curved prickles, large elliptical very acute leaflets, quite hairy both sides, more or less sprinkled all over beneath with fine glands. Its peduncles are 2–3 together, just like those of *R. gracilis*, viz. one short and stout, and two long and slender but straight, glandular hispid, fruit nearly smooth. Sepals spreading, rather fully pinnate.

It is of course possible that both var. *Moorei* and var. *Nicholsonii* have been derived from some very glandular form of *tomentosa*, though few of them are, as a rule, sufficiently glandular; moreover the other characters tend to show a *rubiginosa* parentage, though with which species of the subsection it is difficult to say.

SECTION IV. CANINÆ.

This section of British Roses is by far the largest of the four in which they are comprised. Crépin, Rouy, and Keller all treat it on much the same lines, giving it a broader significance than Déséglise did, who regarded it as equivalent only to the *Eu-caninæ* subsection of the other three authors. The subdivisions followed by these four authors is set forth in my paper on the subsection *Eu-caninæ* in Journ. Bot. 1908, Suppl.

I propose to subdivide the section into three subsections, *viz.* *Villosæ*, *Rubiginosæ*, and *Eu-caninæ*, the last-mentioned having been dealt with in this Journal as above quoted. The leading characteristics of the three are as follows, and though exceptions will be found to all the characters mentioned, there should seldom be any difficulty in referring any example to its proper subsection.

Villosæ.—In their typical form these have straightish, slender prickles, with small bases, very tomentose leaflets, which are often glandular on the lower surface, and almost always very strongly biserrate, peduncles almost always and fruit generally glandular-

hispid or aciculate, sepals erect and more or less persistent, and woolly styles. Some forms make a near approach to the *corii-folia* group of *Eu-caninæ*, and some rarely simulate forms of the *Rubiginosæ*, but, regarding the characters as a whole, the sub-section is a well-defined one.

Rubiginosæ.—These have prickles usually stout and hooked, though sometimes straightish and slender. Their leaflets are biserrate, often hairy, but never densely tomentose as in the last section, and they are covered all over the lower surface with sticky scented glands. The peduncles are almost always and the fruit often glandular-hispid. Sepals much as in the last sub-section. Styles various.

Eu-caninæ.—Prickles for the most part uniform and hooked, leaflets uniserrate and biserrate, glabrous or moderately pubescent, eglandular beneath, or rarely glandular on secondary nerves, never on whole under surface. Peduncles, sepals, and styles various.

SUBSECTION VILLOSÆ.

This subsection is undoubtedly our most complicated and difficult one, and I should have had great difficulty in understanding it at all, but for the most kind assistance of the Rev. A. Ley and Mr. Barclay; the former especially has supplied me with large numbers of specimens of forms I should otherwise have known little about, while Mr. Barclay has most patiently supplied me with many notes and specimens of living plants. Many of the specimens from Mr. Ley have been lent by Mr. Bailey from his own herbarium, to whom my thanks must also be extended. Without these specimens I might have gone astray completely on *R. suberecta* Ley and *R. tomentosa* var. *uncinata* Lees.

Our list at present comprises just two-fifths of the numbers contained in the *Eu-caninæ*, but this to my mind does not simplify matters, and I think the names should be considerably increased in number. At present several of the species have to be regarded in an aggregate sense, as they each really cover a considerable range of individuals. This is, I think, especially true of *R. mollis* Sm., *R. omissa* Déségl., *R. suberecta* Ley, and *R. tomentosa* Sm., and, to a less degree, of several other species. Moreover, it is quite possible to arrange a given collection in various ways, though using the same specific and varietal names, according to individual opinion as to whether greater importance should be given to this or that technical feature, since the characteristics assigned to the various species and varieties by their authors do not vary conjointly. I have, for example, seen specimens which can hardly possibly be assigned to anything but *R. pomifera* Herrm., having quite hooked prickles, and a considerable series might be made of examples which have all the leading features of the *tomentosa* group, but with the subpersistent sepals of that of *Sherardi*. Similarly incongruous combinations are met with in all species, so that the choice lies between the aggre

gation of very heterogeneous material under one name, or the creation of new species or varieties, or at least the adoption of Continental names hitherto unknown, or little known, to British botanists.

Following my plan adopted for the rest of these papers, I have, almost without exception, only dealt with names already in use in this country, and have not suggested any new combinations. It is more than likely that several of our forms, named or unnamed, are covered by Continental names, which would sooner or later be found to be preferable, and would displace any hastily given. Also any new combination would, in all probability, have to be changed again when the subsection is thoroughly revised, as it must be, with the whole genus, in the near future. I even prefer for the present not to publish foreign names given by M. Sudre and Prof. Déséglise to specimens of Mr. Ley till I have seen them, or further study proves them to be identical with or sufficiently near the typical forms to warrant their adoption in our list. Most of the species and varieties will therefore be named as their authors named them, but I have ranged them under the groups to which they must, in my opinion, eventually be referred.

I propose, for the purposes of this paper and not as a final arrangement, to subdivide the subsection into three groups, *viz.* *R. pomifera* (including *R. mollis*), *R. Sherardi* and *R. tomentosa*. Most authors make two subsections, one containing *R. pomifera* and *R. mollis*, the other *R. omissa* (which excludes *R. Sherardi*) and *R. tomentosa*. The main subsectional difference relied upon by such authors is the relative persistence of the sepals, combined with other and less stable features, which on the whole appear to be of less importance than the differences between two such groups as *R. canina* and *R. coriifolia*. It seems hardly consistent, therefore, to subdivide the *Villosæ* into higher grades than groups, especially as that of *Sherardi* is exactly intermediate between the other two, and all shade off imperceptibly into one another.

Briefly the groups may be defined as follows :—

Group of *R. pomifera*. Of low growth. Stems rigid, with straight internodes. Prickles* slender, straight. Leaflets usually densely pubescent, fully biserrate. Upper stipules with falcately incurved auricles (according to Continental authors). Peduncles usually short. Flowers deep rose. Fruit becoming soft and pulpy early, crowned by the subentire persistent sepals, which adheres till the fruit itself decays or falls off. Styles villous.

Group of *R. Sherardi*. Usually low dense bushes, with a habit intermediate between that of the *pomifera* and *tomentosa* groups. Prickles straight or somewhat falcate, rarely uncinate, slender, seldom stout. Leaves, as a rule, densely pubescent, but

---

* The prickles on the middle part of the old stems (which produce the flowering-branches) should be examined. Those on the flowering-shoots themselves, or on the barren shoots, are deceptive and usually uncharacteristic.

occasionally thinly so or even glabrous, biserrate, rarely uniserrate. Upper stipules with porrect or spreading auricles. Peduncles short or long. Flowers usually deep rose, rarely pale or white. Fruit ripening later than in the *pomifera* group, and less pulpy, always retaining its sepals, which are somewhat pinnate, spreading or erect until long after it changes colour, and usually till its complete maturity, but not till its decay. Styles villous, rarely only hispid.

Group of *R. tomentosa*. Usually tall bushes. Habit lax and arching, as in most *canina* forms. Prickles often stout and falcate, sometimes straight, seldom quite hooked. Leaflets more or less pubescent both sides, sometimes quite densely so, sometimes thinly or subglabrous, biserrate, rarely uniserrate. Upper stipules as in last. Peduncles long, sometimes very long (up to four times as long as the fruit). Flowers usually pale or bright, rarely deep rose. Fruit soft when ripe, but hardly pulpy. Sepals, which are often quite pinnate, and flatter on the back than in the last two groups, reflexed or spreading and deciduous before the fruit turns colour, or at the latest, always before it ripens. Styles hispid or glabrous, rarely woolly.

GROUP OF ROSA POMIFERA.

As already stated, I make this include both *R. pomifera* Herrm. and *R. mollis* Sm. They appear to be so intimately connected by intermediates that the differences are only specific, or, as some may think, only of a varietal nature. The leading features of the group may be recapitulated as follows. The bushes are rather short and erect, not arching as in most of the *Eu-caninæ*; their prickles are slender and straight or very nearly so, from small bases; leaflets always densely softly tomentose on both sides, usually rounded at apex, sometimes acute but very rarely acuminate, and the stipules broad with deltoid auricles. Most authors make a feature of the auricles of the upper stipules of the flowering-branches being falcately incurved, instead of porrect or diverging. This is certainly not observable in dried specimens, nor have I been able to discover what is meant from the few living specimens I have had an opportunity of examining. The sepals are entire or very slightly pinnate, and are narrow and very rounded in transverse section. The most important feature is the complete erection and connivence of the sepals as the fruit ripens, and their persistence until its decay. There is no disarticulation at their base, as is usual in the next group, but the bases become incrassated, and often redden with the fruit. The stigmas are always in a dense villous head, so broad as to cover the whole disc, which is, however, not absent, as some authors state, but narrow.

Key to British Species.

1 { Leaflets large, oblong, rather thin. Prickles rather few 2
{ Leaflets smaller, oval or elliptical, thick. Prickles more numerous 3

2 { Leaflets more or less parallel-sided, glandular beneath or not. Prickles very straight. Armature of peduncles and fruit stout *R. pomifera* Herrm.
Leaflets parallel-sided or elliptical-oblong, very glandular beneath. Prickles often slightly curved. Armature of peduncles and fruit weak ..... *R. recondita* Pug.

3 { Fruit small, smooth. Peduncles often smooth or nearly so *R. villosa* var. *cærulea* Woods.
Fruit larger, hispid-glandular. Peduncles always hispid-glandular 4

4 { Leaflets thinly hairy or subglabrous, densely glandular beneath, and often so above. Prickles very straight *R. pseudo-rubiginosa* Lej.
Leaflets densely hairy, almost or quite eglandular beneath 5

5 { Prickles unequal. Leaflets often rather small, pubescence shining. Stipules broad, with deltoid auricles. Sepals subentire. Flowers rose ..... *R. Grenierii* Déségl.
Prickles subequal. Leaflets larger, pubescence dull. Stipules narrow, auricles acuminate. Sepals pinnate. Flowers deep rose *R. mollis* Sm.

Rosa pomifera

Herrmann, Dissertatio de Rosa, p. 16 (1762).

"Calyx-leaves semipinnate, germen globose, aculeate, leaves tomentose both sides.—Stem of the shrub stiff, often reproducing the bush by the extension of the root. Flowers small, purple in the cultivated plant, at least two, more often three on each lateral branch, on short peduncles, the middle flower almost sessile, in the wild plant more often solitary. Peduncles hispid, furnished with lanceolate bracts. Pome globose, rather large, bristly with flexible spines, red throughout maturity, in the wild plant certainly black, as Haller also observed. Calyx-segment patent, doubly appendaged, elongate. Leaflets of the wild plant five, of the garden one seven, the former smaller, the latter larger, decreasing, tomentose on both sides, here and there even hispid, glutinous, soft, greener on the upper surface, toothed, the teeth again denticulate, odoriferous. Petioles terete, villous, armed with straight spinules. Stipules sagittate, broad, hispid on edges, cusps erect. Spines of the stem glabrous, strong, at the nodes and internodes, incurved, green, fuscous in summer. Flowers at the beginning of summer."

The above description, considering the period at which it was written, is fairly clear, yet while it goes into some detail on unimportant points, fails to give prominence to those by which it may be distinguished from *R. mollis* Sm., for the simple reason that neither that nor any other segregate of the group had then been described. The following notes, drawn up from an examination of Déséglise's specimens and description, as well as that of Keller, will, I think, make this species unmistakable.

It forms a strong bush, 2–3½ feet high, rarely reaching 5 feet, sometimes with a short trunk as thick as a man's arm. Bark of branches dark shining brown. Prickles usually few, never numerous, rather small, sometimes rather unequal, straight,

slender, subulate or almost aciculate, from flattish bases. Leaflets thin in texture, large, elongate, usually oblong with parallel sides, 2 in. by 1 in., but forms with more oval leaflets occur, usually rounded at both ends, or subacute at apex, subcordate at base, rarely appreciably narrowed, very finely, but rather densely, softly tomentose above, somewhat more coarsely, but still finely, tomentose beneath, and almost always somewhat, though usually very finely, glandular all over the lower surface. The toothing is compound-serrate. The primary teeth are broader than deep, rather coarse, each with 5–10 denticles on back, and 2–5 on front edge, two or three of the former being much deeper than the rest, so that the leaflets become triserrate. All the denticles are glandular. The petioles are shortly but densely pubescent, almost felted, with a good many subsessile or shortly, rarely longly-stalked glands, and some very small pricklets or none. Stipules broad, especially the upper, broadly rounded or almost amplexicaul at the base, usually glabrous within, and densely glandular-pubescent, or tomentose, with stipitate glands on back, very densely and shortly gland-ciliate on edge, and often quite strongly inciso-dentate. Auricles broadly deltoid, sometimes quite rounded, with an apiculus on the inner side of the median line, which is the nearest approach I have seen to the falcately-incurved form attributed to them. They are very rarely acuminate. Peduncles 2–3, equalling or shorter than the fruit, rarely longer, strongly glandular-hispid, often glandular-aciculate. The true leaves reach the base of the peduncles, so that they are usually ebracteate; the bracts, when present, are small. The fruit is described as being larger than that of *R. mollis*; but comparing the bulk of the specimens of the two species as represented in Déséglise's herbarium, this feature is not apparent. It is usually globose, about $\frac{1}{2}$ in. each way, often less, rarely as much as $\frac{3}{4}$ in. Occasionally it is quite ovoid, with the central one of a cluster somewhat obovoid, glandular-aciculate to a variable degree, but the acicles always stout, the largest often eglandular, rarely almost unarmed. The fruit is violet when ripe. Sepals long and narrow, keeled, or sharply rounded on back, with a subfoliaceous apex, and more or less, occasionally considerably, pinnate, very densely glandular-hispid or glandular-aciculate on back, spreading after the fall of the petals, but soon becoming erect and connivent, incrassate and often coloured at the base, which does not become disarticulated from the fruit, but the sepals persist till its decay. Styles in a broad, densely villous head, usually covering the whole disc, but the latter may often be seen. Petals bright rose-red, or purplish, very often gland-ciliated both at the apex and the base.

Déséglise made the mistake of supposing *R. pomifera* to have its leaflets eglandular beneath, but glands are almost always present, often in considerable quantities; moreover, Herrmann described them as "glutinous." Crépin points out this error (Bull. Soc. Roy. Bot. Belg. xxi. p. 100), and also remarks that the petals, though gland-ciliate on the lobes, are never so, in his experience, at the base. As regards the falcate auricles, which

Subscriptions to the Journal of Botany (16s. post free) for 1910 should now be sent to West, Newman & Co.

No. 569 MAY, 1910 Vol. XLVIII

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

William Hadden Beeby. By Edward S. Marshall, F.L.S. (With Portrait) 121

Inverness and Banff Cryptogams. By J. A. Wheldon, F.L.S., and Albert Wilson, F.L.S. 123

Notes on Synonymy in *Ulmus*. By the Rev. Augustin Ley 130

Ross-shire Plants, 1909. By Rev. E. S. Marshall, F.L.S., and W. A. Shoolbred, F.L.S. .. 132

Short Notes.—*Carex divulsa* × *vulpina* — *Zannichellia gibberosa* Boenn. in South-west Surrey—*Zannichellia gibberosa* Reichb. as a British Plant—*Lecanora mougeotioides* Schaer. in Britain —Abnormal *Carex acuta* L.—Isle of Wight Plants — The Struggle for Existence — *Salicornia appressa* Dum. in Cornwall—John Snippendale—*Beta maritima* in S. E. Yorkshire .. 140

PAGE

Review:—

The Book of Flowers. By Katharine Tynan & Frances Maitland 143

Book-Notes, News, &c. 144

Supplement.—The British Roses. By Major A. H. Wolley-Dod (continued).

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

Owing to certain necessary corrections the 8 pp. (pp. 49-56) Rosa Supplement issued in April number has been reprinted, and is issued herewith. Please cancel previous issue.

LEITZ' NEW MICROSCOPES

possess many advantages over the older type, and embody several important features not to be found in any others.

The modified horseshoe base gives **greater rigidity**, and the larger stage and curved limb **additional working space**, allowing large size Petri dishes, etc., to be examined with convenience. The new fine adjustment, with an endless motion, is **stronger and more durable** than the micrometer screw adjustment, and in the hands of the novice renders **breakage of cover glasses and injury to the front lenses of objectives impossible.** It enables the expert worker to attain **greater speed in focussing**, especially with oil immersion objectives.

The mechanical features in the new models, combined with the high quality of the recently improved objectives, place the Leitz Microscopes in an

UNRIVALLED POSITION.

Prices, with Optical Equipment, from £6 10s.

LEITZ' APLANATIC LENSES

are remarkable for their Large Flat Field, Excellent Definition, and Freedom from Chromatic Aberration.

In Nickel-plated Folders (as figured) from × 8 to × 40, price **12/-** each.
In Mounts to fit Dissecting Microscopes .. .. .. **10/-** ,,

The instruments and lenses may be examined in the showrooms of reputable dealers, or at the firm's London Branch, where demonstrations of latest inventions are frequently given.

DESCRIPTIVE CATALOGUE FREE ON REQUEST.

E. LEITZ, **OXFORD HOUSE, 9, OXFORD ST., LONDON, W.**

Telephone: Gerrard 1674. Agents in all University Centres.

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

THE JOURNAL OF BOTANY was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to WEST, NEWMAN & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

WILLIAM HADDEN BEEBY.

(1849—1910.)

(WITH PORTRAIT.)

THE only son of William John and Elizabeth Beeby, the subject of this memoir was born on June 9th, 1849. Leaving school very young, for some years he worked with an uncle; then he served under the Union Discount Company of London, and afterwards became cashier in the Bank of Tarapaca and London, retiring last June. For about two years before his death on Jan. 4th, 1910 he suffered from angina pectoris, caused by overstraining his heart while botanizing in Shetland; and the end came suddenly, being due to aneurism of the aorta. His remains were cremated at Woking, four days later. In 1892 he married Miss Florence Emma Hardcastle, of London, who, with their only son, now fifteen years old, survives him.

Beeby was at one time a first-class performer on the flute, and only gave up playing through a bad accident to his hand, caused by barbed wire. A Fellow of the Royal Microscopical Society, he was politely amused, when on a flying visit to us at Witley, by my wife's enquiry whether he understood the working of a compound microscope which she had recently given to me! Mr. Arthur Bennett writes:—"He was the most careful British botanist that I ever knew. He spared no pains and time to get at the truth; even ordinary plants were examined with the microscope." This opinion I can most cordially endorse. Having known almost all our leading botanists during the last quarter of a century—several of them much more intimately than I knew him—I can say that he taught me more than any other of the many friends who have kindly helped me towards a knowledge of our critical plants. Before he became so much tied by official duties, he was an ardent sportsman; he always keenly appreciated wild life, and in his prime thought nothing of wading knee-deep in lakes or marshes for many hours. A somewhat shy, reserved man (though this tendency was not conspicuous in his correspondence), he was mainly known to other workers by his published papers; indeed, he once told me that he much preferred solitary expeditions.

My acquaintance with him goes back to 1884, when he was in bachelor lodgings at 14, Ridinghouse Street. Although a great many letters passed between us, we had not met for about twenty years; he had hoped to stay at our Somersetshire home next summer, but this was not to be. Himself scrupulously accurate, he was impatient of vagueness, or slipshod statements, or pretension in others; and his strictures were sometimes too bluntly expressed. With the sweeping and shifting changes in nomenclature, which many besides himself dislike, he was not in sympathy; for example, he considered that the Vienna legislation was largely *ultra vires*, and he specially objected to the insistence on Latin descriptions, which bore hardly on capable

men like himself who had been unable to complete their classical studies.

Beeby made his mark earlier than most, and few mistakes could be laid to his charge. *A propos* of *Taraxacum*, on which he had promised the Editor a paper only the other day, he wrote to me: "What I know, I know"; this remark was both true and characteristic. His unusually acute mind seemed instinctively to grasp the salient points of any critical form; and this advantage was combined with that *labor limæ* which is distasteful to most quick-witted people.

For many years Beeby was engaged in the preparation of a new Flora of Surrey, systematically visiting the less known and more unpromising parts of the county and making exhaustive lists of even the commonest plants; for he was no mere rarity-hunter, though so successful in his discoveries. Finding that his leisure-time was insufficient for the editorial work, he offered to hand this over to me; but other calls and my great distance from town forbade my undertaking the task, and at my suggestion it was entrusted to the capable hands of our friend Mr. C. E. Salmon.

So long ago as 1886 he paid his first visit to Shetland; and in that *ultima Thule* he spent many summer holidays, with splendid results. His good knowledge of the Scandinavian Flora was of great service here; and I think that his most valuable work was done in those islands. What may be called "comparative" topographical botany was one of his hobbies; he was also much interested in the study of evolution.

Beeby's critical gatherings are to some extent represented in the National Herbarium; the Surrey and Shetland collections will shortly (by his expressed wish) be placed in the Museum founded by Mr. A. O. Hume, and will thus be accessible to students.

Possessing a remarkable knowledge of our plants in general, and an unrivalled acquaintance with some genera, Beeby does not seem to have paid much attention to *Rubus* and *Rosa*, which he advised me, when almost a beginner, to let alone for a time. Had health and strength continued, he would beyond a doubt have further increased our knowledge of the British Flora, especially in its relation to that of Arctic and sub-Arctic Europe. So far as I am aware, he never visited Ireland.

From the *London Catalogue* I have mainly compiled the following list, probably incomplete, of the numerous additions made by him to our list:—*Cochlearia grœnlandica* L.; *Sisymbrium officinale* Scop. var. *leiocarpum* DC.; *Viola hirta* L. forma *lactiflora* Reichb.; *V. Riviniana* Reichb. forma *villosa* Neum. Wahlst. & Murb. and var. *nemorosa* Neum. Wahlst & Murb.; *Arenaria peploides* L. var. *diffusa* Hornem.; *Hypericum pulchrum* L. var. *procumbens* Rostrup; *Medicago lupulina* L. var. *Willdenowiana* Koch; *Anthyllis Vulneraria* L. vars. *ovata* Bab. and *Allionii* DC.; *Spiræa Ulmaria* L. var. *denudata* Boenn.; *Callitriche polymorpha* Lonnr.; *Epilobium palustre* L. var. *lavandulæfolium* Lec. & Lamotte (perhaps a good variety—it remained

constant for some years in my garden); *Achillea Millefolium* L. vars. *alpestris* Wimm. & Grab. and *villosa* Hartm. (*lanata* Koch); *Matricaria inodora* L. var. *phæocephala* Rupr.; *Hieracium auratum* Fr. var. *thulense* F. J. Hanb.; *Taraxacum spectabile* Dahlst.; *Gentiana baltica* Murb.; *Euphrasia curta* Wettst. forma *piccola* Towns.; *E. foulaensis* Towns.; *Rhinanthus grœnlandicus* Chabert; *Plantago Coronopus* L. var. *pygmæa* Lange; *Polygonum viviparum* L. var. *alpinum* Wahl.; *Juncus pygmæus* Rich.; *J. capitatus* Weigel; *Luzula sylvatica* Gaud. var. *gracilis* Rostrup; *Sparganium erectum* L. (*ramosum* Curt.) var. *microcarpum*; *S. affine* Schnizl. var. *microcephalum* Neum.; *S. affine* × *ramosum*; *Potamogeton vaginatus* Turcz.; and *Equisetum arvense* × *limosum* (*E. litorale* Kühlew.)

Beeby also detected the true origin of some hybrids, besides describing the undermentioned species and varieties:—*Caltha radicans* Forst. var. *zetlandica* (since rightly discarded as a mere leaf-form, which is much more frequent than the typical plant); *Viola hirta* L. forma *rosea* and var. *glabrata*; *Cerastium arcticum* Lange var. *Edmondstonii* (*C. nigrescens* Bab., *prius*; cultural experience tended to prove that this was only a soil-state); *Hieracium Schmidtii* Tausch var. *fealense*; *H. dovrense* Fr. var. *Hethlandiæ*; *H. breve*; *H. zetlandicum*; *H. demissum* Strömf. var. *australius*; *H. subtruncatum*; *H. strictum* Fr. vars. *congestum* and *vinaceum*; *Taraxacum spectabile* Dahlst. subsp. *Gerhildæ*; and *Sparganium neglectum*, a species which has been called in question, but which I consider to be thoroughly distinct. This is an extraordinary record of original work for a man who died at sixty years of age; and it may be said of him, almost without exaggeration, that "nihil tetigit quod non ornavit."

In recognition of his scientific attainments, Beeby was elected an Associate of the Linnean Society on May 5th, 1887; he became a Fellow on June 5th, 1890. At his especial request, however, the record of his Associateship, which he rightly regarded as the greater honour, was mentioned in the entry of his name in the list of Fellows.

The portrait is from a photograph by Messrs. Maull & Fox.

EDWARD S. MARSHALL.

INVERNESS AND BANFF CRYPTOGAMS.

BY J. A. WHELDON, F.L.S., & ALBERT WILSON, F.L.S.

FOUR days spent amongst the Cairngorm Mountains about the middle of July, 1909, resulted in the discovery of a number of Mosses and Lichens additional to those found in the same district the previous year, and recorded November, 1908, pp. 347–356.

On this latter occasion the ground worked was again principally in East Inverness-shire, v.-c. 96, but we also included an examination—all too short and imperfect—of the most alpine

portion of Banff, v.-c. 94, at the head of Glen Avon. Briefly stated, our route was as follows: Starting from Kincraig Station on the Highland Railway, we ascended Geal Charn and Sgoran Dubh from the Glen Feshie side, descending into Glen Eunach by a corrie at the head of the glen. After spending the night at the upper bothy, we ascended Braeriach as far as the tarn called Loch Coire an Lochan, situated at an altitude of 3250 ft.—the highest sheet of water of its size in Britain—on the north side of the mountain. Here we worked a small portion of ground by some patches of snow, at the base of the granite cliffs, which rise above the loch, and found several mosses of considerable interest; but a detailed examination of the rocks or further progress up the mountain was impossible owing to mist and the fury of the wind. We therefore descended into Glen Eunach, and thence through Rothiemurchus Forest to Aviemore. Next day was spent in the Aviemore neighbourhood, exploring the woods on Craig Ellachie and the banks of the Spey. On the fourth day we ascended Cairngorm and Ben Macdhui, by way of Glen More Forest, Coire an-t Sneachda, and the head of Glen Avon, returning by Creag a Chalamain and the Larig Ghru.

Owing to the late cold season a good deal of snow still remained in the higher corries, and this unfortunately prevented an examination of what is presumably the best ground for high alpine species. The plants mentioned in the following list are mostly additional to those given in our previous paper, but a few of the rarer species there named are included where further localities are of interest. Additions to the Census Catalogues of Mosses and Hepatics and to our previous list are marked with an asterisk. We have to express our thanks to Messrs. H. N. Dixon and S. M. Macvicar for help with some of the more critical species.

Sphagnaceæ.

Sphagnum papillosum Lindb. var. *normale* W. *94. Cairngorm at 3500 ft. 96. Coire an-t Sneachda at 3400 ft.— Var. *sublæve* Limpr. 96. Craig Ellachie, a robust tall form. — *S. compactum* De Cand. var. *imbricatum* W. *94. Ben Macdhui at 3500 ft.—*S. squarrosum* Pers. var. *imbricatum* Schp. *96. Craig Ellachie.—*S. cuspidatum* (Ehrh.) W. var. *submersum* Schimp. *94. Cairngorm.—*S. recurvum* (P. B.) W. var. *mucronatum* (Russ.) W. *94. Cairngorm.—*S. molluscum* Bruch. *94. Cairngorm at about 3800 ft.—*S. Girgensohnii* Russ. var. *stachyodes* Russ. *96. Near the head of Glen Eunach. An interesting form accidentally brought home in small quantity with a tall bog form of *Mnium punctatum*. With all the characters of var. *stachyodes*, it has in addition the apices of the leaves conspicuously recurved as in var. *squarrosula* Russ. — *S. rubellum* Wils. var. *versicolor* Russ. *94. Cairngorm at 3500 ft. — *S. fuscum* (Schp.) Klinggr. *94. Cairngorm, with the preceding. 96. Glen Feshie. — *S. quinquefarium* (Lindb.) W. *94. Ben Macdhui at 3500 ft. — Var. *virescens* Warnst. *96. Sgoran Dubh, Glen Feshie side, at 3400 ft.—*S.*

subnitens R. & W. var. *griseum* W. *96. Near the head of Glen Eunach. — *S. contortum* Schultz (= *laricinum* Spruce). *96. Craig Ellachie. — *S. subsecundum* (Nees) Limpr. *94. A very small form, as small as *S. molluscum*, on Cairngorm.—*S. rufescens* Limpr. *94. Cairngorm at about 3500 ft.

Musci Veri.

Andreæa petrophila Ehrh. *94. Ben Macdhui at 3500 ft. Much the most abundant species on the parts of these mountains which we visited. — Var. *acuminata* B. & S. *94. Ben Macdhui and Cairngorm at 4000 ft. — Var. *alpestris* Thed. *94. Ben Macdhui at 4000 ft. — Var. *gracilis* Thed. *94. Cairngorm and Ben Macdhui at 4000 ft.—*A. alpina* Sm. Occurs thinly scattered in the district, but is much poorer and less luxuriant than in the English Lake District, perhaps because the climate of the Cairngorms is drier. *94. Ben Macdhui, on rocks above Loch Avon at 3800 ft. *96. Rocks at head of Coire an-t Sneachda, Cairngorm, at 3700 ft.—*A. Rothii* W. & M. 94. Cairngorm, together with a form approaching var. *hamata* Lindb. 96. On Cairngorm with the preceding species.—*A. nivalis* Hook. Contrary to our expectations, we found this very scarce. We saw it, in small quantity only, on scars above Loch Avon on Ben Macdhui, at about 3800 ft. (94).

Polytrichum piliferum Schreb. 94. Ascends to 3500 ft. on Ben Macdhui. — *P. urnigerum* L. 96. Ascends to 3700 ft. on Sgoran Dubh. — *P. sexangulare* Flörke. 94. With young fruit on rocks above Loch Avon, Ben Macdhui at 3800 ft. The attempt was made to ripen the fruits under glass at Liverpool, but they made no growth and shrivelled away. 96. By melting snow-drifts below the crags above Loch Coire an Lochan, Braeriach at 3300 ft.

Dicranella squarrosa Schp. 94. Ascends to 3600 ft. on Cairngorm.

Blindia acuta B. & S. *94. Cairngorm.

Dicranum Starkei W. & M. 94. Ben Macdhui at 3500 ft. 96. Above Loch Coire an Lochan, Braeriach, and in Coire an-t Sneachda, Cairngorm.—*D. falcatum* Hedw. 94. Ben Macdhui at 3800 ft. 96. Rocks at the head of Glen Eunach at 3600 ft.—*D. fulvellum* Smith. *94. On Ben Macdhui with the preceding. 96. Head of Glen Eunach at 3600 ft.—*D. molle* Wils. *94. Ben Macdhui at 3800 ft., and on Cairngorm. — *D. scoparium* Hedw. 94. Ascends on Ben Macdhui to 3500 ft., and *D. fuscescens* Turn. to 4000 ft.—*D. congestum* Brid. var. *flexicaule* B. & S. *94. Cairngorm at 3500 ft.

Leucobryum glaucum Schp. *94. Cairngorm at 3300 ft.

Grimmia apocarpa Hedw. var. *alpicola* Hook. & Tayl. *96. Sgoran Dubh. — *G. incurva* Schwaeg. *94. Ben Macdhui at 3800 ft.—*G. funalis* Schimp. 96. Coire an-t Sneachda at 3400 ft. — *G. torquata* Hornsch. 96. Very fine on Craig Ellachie. — *G. trichophylla* Grev. *94. Sparingly on Cairngorm.—*G. patens* B. & S. *94. Cairngorm at 3500 ft.

Rhacomitrium heterostichum Brid. var. *alopecurum* Brid. *94. Cairngorm at 3800 ft. — Var. *gracilescens* B. & S. *94. Ben Macdhui at 3700 ft.—*R. fasciculare* Brid. 94. Ascends to 4000 ft. on Cairngorm.—*R. lanuginosum* Brid. forma *epilosa*. 94. Boggy ground on Ben Macdhui at 3800 ft. — *R. ellipticum* B. & S. *94. Cairngorm at 3700 ft.

Barbula rubella Mitt. 96. Fruiting at 3500 ft. on Sgoran Dubh.

Leptodontium flexifolium Hampe. *96. Head of Glen Eunach at 3000 ft.

Zygodon lapponicus B. & S. *96. Rocks in Glen Eunach at 3000 ft., and fruiting at 3600 ft. in Glen Feshie.—*Z. Mougeotii* B. & S. 96. Craig Ellachie.

Ulota Drummondii Brid. 96. Abundant and fruiting on alders in Glen Feshie.—*U. crispa* Brid. and *U. Bruchii* Hornsch. With the preceding.

Orthotrichum stramineum Hornsch. *96. Craig Ellachie.—*O. affine* Schrad. var. *rivale* Wils. 96. Trees by the Spey near Aviemore.

Tetraplodon mnioides B. & S. 94. Ascends to 3600 ft. on Cairngorm, and (96) the same height on Sgoran Dubh.

Conostomum boreale Swartz. *94. Ben Macdhui at 3800 ft.

Philonotis fontana Brid. var. *compacta* Schimp. *94. Ben Macdhui at 3800 ft.

Webera nutans Hedw. *94. Fruiting on Cairngorm at 3900 ft. —*W. cruda* Schwg. *94. Ben Macdhui at 3500 ft.—*W. Ludwigii* Schimp. *94. Cairngorm at 3600 ft. and Ben Macdhui at 3800 ft. 96. Near the head of Glen Eunach, a semi-aquatic form with elongated stems, laxly spreading and obtuse leaves.—*W. albicans* Schimp. 94. Ascends to 3500 ft. on Cairngorm.

Mnium punctatum var. *elatum* Schimp. *96. Head of Glen Eunach.

Fontinalis antipyretica L. var. *gracilis* Schp. 96. Glen Feshie. —*F. squamosa* L. *96. Head of Glen Eunach.

Pterygophyllum lucens Brid. 96. Craig Ellachie.

Heterocladium dimorphum B. & S. *96. Head of Glen Eunach, growing along with *H. heteropterum* B. & S.

Plagiothecium elegans Sull. *94. Ben Macdhui. — *P. Muhlenbeckii* B. & S. *96. Cairngorm at about 3500 ft. — *P. undulatum* B. & S. 94. A small short-leaved alpine form on Cairngorm at 3500 ft. — *P. denticulatum* B. & S. var. *majus* Boul. *96. Craig Ellachie near Aviemore. — Var. *obtusifolium* Hook. & Tayl. *96. Damp slope above Loch Coire an Lochan, Braeriach, at 3300 ft. Resembling *P. Kinlayanum* Stirton, which Mr. Dixon informs us is an extreme state of this variety.

Hypnum exannulatum Gumb. var. *purpurascens* Schimp. *94. Cairngorm at about 3500 ft. — *H. revolvens* Sw. *94. With the preceding. — *H. callichroum* Brid. 96. Head of Glen Eunach.—*H. molluscum* Hedw. var. *condensatum* Schp. *96. Coire an-t Sneachda, Cairngorm.—*H. sarmentosum* Wahl. 96. Fruiting, on ledges of rock watered by melting snow, above Loch Coire an

Lochan at 3300 ft.—*H. Schreberi* Willd. *94. Cairngorm at 3500 ft.

Hylocomium splendens B. & S. *94. Cairngorm at 3600 ft.—*H. loreum* B. & S. *94. Cairngorm at 3500 ft.

Hepaticæ.

Aneura pinguis (L.) Dum. *94. Boggy place above Loch Avon, Ben Macdhui.

Pallavicinia Blyttii Lindb. *94. Rocks above Loch Avon, Ben Macdhui at 3800 ft.

Gymnomitrium obtusum Pears. 94. Cairngorm. 96. Sgoran Dubh, Glen Feshie at 3600 ft., and Sgor Gaoith, Glen Eunach at 3000 ft.—*G. alpinum* Schffn. *94. Ben Macdhui at 3800 ft. *96. Sgoran Dubh at 3600 ft., and at about the same altitude in Coire an-t Sneachda, Cairngorm.— *G. crassifolium* Carr. *94. Ben Macdhui at about 4000 ft.

Marsupella sphacelata Lindb. *96. Amongst Sphagna on the slope of Braeriach towards Glen Eunach, with *Scapania uliginosa*, &c. We owe the detection of this to the keen vision of our friend Mr. M. B. Slater, to whom we sent a portion of our gathering of *Scapania uliginosa*.—*M. aquatica* Schffn. *94. Cairngorm.

Nardia scalaris Gray. 94. Ben Macdhui up to 3800 ft.—*N. compressa* Gray. *94. Cairngorm up to 3800 ft.—*N. obovata* Carr. 96. Head of Glen Eunach at 3000 ft.

Aplozia pumila Dum. *94. Ben Macdhui at 3600 ft.—*A. cordifolia* Dum. *94. Cairngorm at 3500 ft.

Lophozia inflata Howe. *94. Ben Macdhui above Loch Avon. 96. A small dark-coloured and rigid form at 3600 ft., Coire an-t Sneachda, Cairngorm. Mr. Macvicar informs us that the highest station previously recorded for Scotland was 3100 ft.—*L. ventricosa* Dum. *94. Cairngorm at 3500 ft. 96. Coire an-t Sneachda at 3400 ft.—*L. alpestris* Evans. 94. Cairngorm.—*L. incisa* Dum. *94. Cairngorm.—*L. Floerkii* Schffn. *94. Boggy ground above Loch Avon, Ben Macdhui. 96. Amongst *Dicranum fuscescens* on Sgoran Dubh, Glen Feshie at 3600 ft.

Lophocolea heterophylla Dum. *96. On trees near Aviemore.

Cephalozia lunulæfolia Dum. *94. Amongst *Sphagnum* on the slope of Ben Macdhui above Loch Avon.—*C. bicuspidata* Dum. 94. Ben Macdhui at 3800 ft.

Ptilidium ciliare Hampe. *94. Cairngorm at 4000 ft., and Ben Macdhui at 3900 ft.

Chandonanthus setiformis Lindb. var. *alpinus* Hook. *94. Amongst *Mylia Taylori* on Ben Macdhui at 3500 ft.

Diplophyllum taxifolium Dum. *94. Cairngorm.

Scapania purpurascens Tayl. *94. Cairngorm at 3900 ft. 96. Sgoran Dubh at 3600 ft. A form occurs on both Cairngorm and Ben Macdhui having the leaves almost entire, the uppermost only showing two or three short teeth.—Var. *speciosa* Nees. *94. Cairngorm at 3500 ft.—*S. undulata* Dum. *94. Boggy ground above Loch Avon, and in the stream on the plateau of Ben Macdhui.—*S. uliginosa* Dum. and *S. obliqua* Schiffn. *94. Grow-

ing intermixed on Cairngorm at 3500 ft. 96. Sgoran Dubh, Glen Feshie at 3600 ft.

Radula complanata Dum. 96. Craig Ellachie.
Lejeunia cavifolia Lindb. *94. Cairngorm at 3600 ft.

LICHENES.

Sphærophorus coralloides Pers. 94. Ben Macdhui. — *S. compressus* Ach. 96. On boulders near Loch Eunach.

Stereocaulon evolutum Græwe. 96. Creag na Leacainn at 3400 ft. — *S. tomentosum* Fr. 96. Geal Charn, Glen Feshie. — *S. alpinum* Laur. 96. Creag na Leacainn at 3800 ft.—*S. denudatum* Flörke. 94. Cairngorm at 4000 ft., and on rocks above Loch Avon. 92. Ben Macdhui slopes above the Pools of Dee.—*S. condensatum* Hoffm. 94. Ben Macdhui at 3800 ft.

Cladonia gracilis Hoffm. (*C. hybrida* var. *chordalis* Mudd.). 96. Creag a Chalamain at 2400 ft.—*C. cervicornis* Schaer. 94. Cairngorm and Ben Macdhui up to 4200 ft.— *C. furcata* Hoffm. 92. Above the Pools of Dee at 3700 ft. — f. *spadicea* Ach. 94. Cairngorm at 3600 ft.—*C. bellidiflora*. 96. Near Loch Coire an Lochan at 3300 ft. — *C. deformis* Hoffm. 26. Slope of Braeriach below Loch Coire an Lochan.— *C. digitata* Hoffm. 96. With the preceding on Braeriach.— *C. macilenta* Hoffm. f. *intumescens* Cromb. 94. Cairngorm at 3800 ft.

Cladina rangiferina Nyl. 94. Cairngorm at 3500 ft.—*C. sylvatica* Nyl. 94. Cairngorm. 92. Above the Pools of Dee on Ben Macdhui at 3700 ft.—*C. uncialis* Nyl. f. *bolacina* Cromb. 92. With the preceding.—f. *aduncа* Cromb. 94. Cairngorm at 3700 ft. —f. *obtusata* Nyl. 96. Sgoran Dubh, Glen Feshie at 3600 ft.

Thamnolia vermicularis Schaer. 92. Slope of Ben Macdhui above the Pools of Dee at 3700 ft.

Usnea ceratina Ach. 96. Trees near Kincraig.

Alectoria nigricans Nyl. 94. Cairngorm at 3900 ft.—*A. divergens* Nyl. 96. Very sparingly on the slope of Braeriach towards Glen Eunach at 3100 ft. growing amongst *Loiseleuria procumbens*. —*A. subcana* Nyl. 96. Sparingly on trees near Kincraig.

Evernia furfuracea Ach. var. *platyphylla* Rbh. 96. On Scots pine near Kincraig.

Cetraria islandica Ach. 94. Cairngorm at 3800 ft.—*C. crispa* Nyl. 94. Cairngorm up to 4000 ft. 96. Creag na Leacainn at 3400 ft. 92. Ben Macdhui at 4200 ft. — *C. aculeata* Fr. 94. Cairngorm, noted at 3800 ft. — Var. *hispida* Cromb. 94. Ben Macdhui.

Platysma Fahlunense Nyl. 94. Cairngorm. — *P. commixtum* Nyl. Sgoran Dubh, Glen Eunach, 3650 ft.

Parmelia saxatilis Ach. and *P. omphalodes* Ach. 94. Cairngorm.—Var. *alpestris* Lamy. 96. Geal Charn, Glen Feshie, and Creag na Leacainn at 3400 ft.—*P. sulcata* Tayl. f. *lævis* Nyl. 96. On alders in Glen Feshie. — *P. lanata* Wallr. 94. Cairngorm up to 4000 ft., and on the summit of Ben Macdhui.—*P. tristis* Nyl. 94. Fruiting on Cairngorm, and on Ben Macdhui up to 4200 ft.

Parmeliopsis ambigua Nyl. 96. On old trees in the Larig Ghru

Pass. — *P. aleurites* Nyl. 96. With the preceding, and on pine-trunks near Kincraig.

Lobarina scrobiculata Nyl. 96. Sparingly on trees in Glen More Forest above Loch Morlich.

Nephromium tomentosum Nyl. 96. Sparingly on birches in Rothiemurchus Forest. — *N. lusitanicum.* 96. On mossy tree-trunks, Glen More Forest, sparingly.

Peltidea aphthosa Ach. 96. Craig Ellachie, Aviemore.

Peltigera polydactyla Hoffm. Near Aviemore.

Gyrophora proboscidea Ach. 94. Cairngorm and Ben Macdhui up to 4100 ft., with f. *fimbriata* Mudd. and f. *exasperata* Ach.—Var. *deplicans* Fr. fil. 94. Ben Macdhui at 3800 ft.—*G. cylindrica* Ach. 94. Frequent, with vars. *denticulata* Ach., *denudata* Mudd., and *fimbriata* Ach., ascending on Cairngorm to 4060 ft. — Var. *Delisei* Fr. 94. Cairngorm at 4000 ft. 96. Coire an-t Sneachda at 3000 ft. — *G. erosa* Ach. 94. Cairngorm at 3450 ft., also on Ben Macdhui. 96. On boulders near Loch Coire an Lochan, Braeriach.—*G. torrefacta* Cromb. 94. Cairngorm at 3700 ft.—*G. hyperborea* Ach. 94. Very sparingly on Ben Macdhui at 3800 ft. —*G. polyphylla* Turn. & Borr. and f. *glabra* Nyl. 94. Cairngorm. —*G. polyrhiza* Krb. 94. Sparingly on Ben Macdhui.

Psoroma hypnorum Nyl. 96. Sgor Gaoith at 3000 ft.

Lecanora chlarona Nyl. f. *pinastri* Cromb. 96. On Scots pine in Rothiemurchus Forest. — *L. tartarea* Ach. 94. Ben Macdhui. —Var. *frigida* Ach. 94. Cairngorm. 96. On Sgor Gaoith, and on Braeriach, observed up to 3650 ft. 92. Ben Macdhui at 4000 ft. — *L. oculata* Ach. 96. Sgoran Dubh, Glen Feshie at 3500 ft.

Lecidea atro-rufa (Dicks.). 94. On bare earth amongst rocks on Cairngorm at 3500 ft. — *L. contigua* Fr. 94. Cairngorm. — *L. Friesii* Ach. 96. On dead birch-trees, Larig Ghru below Castle Hill.—*L. decolorans* Flk. 94. Above Loch Avon, Ben Macdhui.—*L. alpestris* (Smrf.). 94. Cairngorm and Ben Macdhui up to 4000 ft. 96. Sgoran Dubh, sparingly. 92. On Ben Macdhui at 4100 ft. —*L. arctica* Smrf. 94. On Ben Macdhui, sparingly with the preceding. 96. Sgoran Dubh, Glen Feshie at 3600 ft.—*L. lapicida* Fr. 94, 96, and 92. Occurs in all three counties, ascending to the summit of Ben Macdhui. An athalline condition is frequent on small loose stones.—*L. subvernalis* Stirt. 96. On dead trees below Coire an-t Sneachda. — *L. squalida* Ach. 94. A small specimen found on bare earth, Ben Macdhui, associated with *L. alpestris*, is believed to belong here, but we have not been able to verify the name by comparison with an authentically named example. It occurred at an altitude of 3900 ft., and may be more plentiful than this single record indicates, but it is very inconspicuous, and was not observed until we were working out our gatherings at home.—*L. grossa* Pers. 96. Glen More Forest.—*L. diluta* Pers. 96. On conifers below Coire an-t Sneachda. — *L. geographica* L. 94. On the summit of Ben Macdhui, 4296 ft.

NOTES ON SYNONYMY IN *ULMUS*.

By the Rev. Augustin Ley.

In connection with my paper in the March number of the Journal, the Editor kindly allows me space for the following Notes:—

U. scabra Miller. This is stated by Gürke to be the *U. campestris* of the Linnæan herbarium. British authors, on the other hand, have uniformly, so far as I know, maintained that the plant of Linn. herb. is the "common" not the "Wych" Elm. Without attempting to settle between these two views, the question whether Linnæus' name can be rightly used, and, if used, to which segregate it must be assigned, becomes an important one, when the British Elms are divided into five instead of two species. Miller describes *U. campestris* as distinct from his *U. glabra*, and he is followed by Smith, Lindley, and Loudon. Yet the type specimen of Miller's *campestris* in Herb. Br. Mus., and the figures in Eng. Bot. (referred to also by Lindley), t. 1886 (*campestris*) and t. 2248 (*glabra*), prove beyond question that both these names describe plants falling under the aggregate *U. glabra* Miller, as used in my paper. This points to continuing the use of Linnæus' name *campestris* for the "small-leaved" Elm of Britain and the Continent; placing *U. glabra* Miller under it as a variety, if valid varietal distinctions can be pointed out, or relegating it to the list of synonyms. The writer, however—in view of the fact that Linnæus recognised only a single European species, and that botanists of the highest standing do not agree as to which this species is; considering, moreover, the possibility that Linnæus' Elm (excluding *U. vegeta* as possibly a hybrid form, and *U. surculosa* as endemic to Britain) may have been either *U. glabra* Miller or *U. major* Smith—has thought it best to drop the Linnean name, and to use that to which no doubt attaches, *U. glabra* Miller.

It may be worth while to quote Miller's, Smith's, and Lindley's descriptions of *U. campestris* somewhat *in extenso*:—

"*Ulmus campestris foliis oblongis acuminatis duplicato-serratis, basi inequalibus.* Elm with oblong acute pointed leaves which are doubly sawed on their edges and unequal at their base. *Ulmus vulgatissima folio lato scabro.* Ger. Emac. 1481. The common rough or broad-leaved Wych Elm. Very common in the north-west counties of England, where it is generally believed to grow naturally in the woods: this grows to a large size. The bark of the young branches is smooth and very tough, but that of the old trees cracks and is rough. . . . . The flowers are succeeded by oval-bordered capsules containing one roundish compressed seed which opens in May."—Miller.

Whatever may be thought of the latter part of this description, and of Miller's reference to Gerard's plant, which do not seem to fit well any form of *U. glabra* Mill., Miller's own type

specimen in Herb. Mus. Brit. indicates his *U. campestris* to have been a *glabra* form.

"*U. campestris*. Common Elm. Leaves doubly serrated, rough, unequal at the base. Flowers nearly sessile, four-cleft, with four stamens. Fruit oblong naked. The leaves come forth as the fruit ripens, and are alternate on short stalks, ovate, inclining to rhomboid . . . rough on both sides, from one to three inches long."—Smith. On contrasting this with his description of *U. glabra*, it will be apparent that Smith had in his mind a tetrandrous, broad and rough-leaved variety of *U. glabra* Miller. One is tempted, from his description of the leaves, to assume that he is speaking of *U. surculosa* Stokes; but this is precluded by his description of the fruit; besides, Smith's *U. suberosa* is certainly *U. surculosa*.

"*U. campestris*. Narrow-leaved English Elm. Leaves rhomboid-ovate acuminate, wedge-shaped and oblique at base, always scabrous above, doubly and irregularly serrated, downy beneath, serratures incurved. Branches wiry, slightly corky. Fruit oblong, deeply cloven, naked. E. B., 1886."—Lindley.

Lindley's description of the leaves in his *U. campestris* might suggest a different plant from Smith's; but his reference to the E. B. figure precludes doubt. His reference to suberosity in his plant suggests that he might include var. *suberosa* Moench.

Miller's other names, *sativa* and *minor*, appear to refer to forms of the same polymorphous tree. *Minor* has been dealt with in my paper; the description of *sativa* is as follows:—"Foliis ovatis acuminatis duplicato serratis, basi inequalibus. Ulmus minor folio angusto scabro of Gerarde." Miller goes on to say of *sativa*, "Commonly known in the nursery gardens by the title of English Elm, which is far from being a right appellation, for it is not a native of England, and is only found growing near London, or in plantations where the young trees were procured from the neighbourhood of London."

It is likely that the name of *glabra* may have contributed by the uncertainty of its connotation to confuse the synonymy, "glabrous" being often used as meaning "smooth," whereas it rightly signifies "hairless," *lævis* being smooth, and *scabra* rough, to the touch.

U. glabra of Hudson, Flor. Ang. (1762) is clearly a combination. He describes two varieties (a) "U. folio latissimo scabro" being shown by Buddle's specimen in the Sloane Herb. (to which he refers) to be *U. scabra* Miller, (b) "*U. folio glabro*" being again shown, by his reference to the same herbarium, to be *U. glabra* Miller.

U. suberosa Moench. It is assumed in my paper that Moench's and Ehrhart's description is of the plant placed as var. *suberosa* under *glabra* Miller. Though this plant is no doubt included, it might be hard to prove that other suberous Elms of the Continent of Europe can be excluded. The only suberous plant to be reasonably excluded from this being *U. surculosa* Stokes—the *U. suberosa* of Smith, Lindley, and other British authors.

U. major Sm. was described in Eng. Bot. "on specimens of E. Forster, who is convinced that it is distinct." *U. hollandicus* Mill. and *U. major hollandica* Plukenet are quoted by Smith as synonyms; but an original specimen of Plukenet's in the Herb. Mus. Brit. is *U. scabra* Miller, nearly typical both in leaf and samara! Hence it has not been thought safe to use Miller's name *hollandica* for Smith's plant.

[Mr. Ley has so long been a valued contributor to this Journal that we cannot refuse to print the foregoing notes in deference to his strong insistence on their importance in connection with his paper in our March issue. We must, however, disclaim any responsibility for his references, which we have not checked, or for his conclusions, in which we are not disposed to concur.—Ed. Journ. Bot.]

ROSS-SHIRE PLANTS, 1909.

By Rev. E. S. Marshall, F.L.S., and W. A. Shoolbred, F.L.S.

Our collections were chiefly made in the immediate neighbourhood of Garve, 106 E. Ross, to which vice-county everything without a prefixed number should be credited; only two short walks were taken near Kyle of Loch Alsh, 105 E. Ross.

For help in determining critical forms we have especially to thank Messrs. A. Ley and E. F. Linton, together with Major A. H. Wolley-Dod, who also kindly submitted our *Rosa*-gatherings to M. Sudre.

It should be mentioned here that, although Oykell Bridge is usually reckoned as belonging to Sutherland, the hotel and nearly all our exploring ground of 1908 in that district are in E. Ross; we had overlooked the fact (since kindly pointed out by Mr. G. Goode) that the River Oykell is the county boundary thereabouts, so that the alleged stations in 107 should be transferred to 106, though doubtless most of the plants recorded occur in both.

Supposed new county notices are starred; but it has become a matter of considerable and increasing difficulty to make sure that they are really such.

Ranunculus Flammula L. var. *radicans* Nolte. Stony shores of Loch Luichart.

Caltha radicans Forst. By the river, near Conan.

Meconopsis cambrica Vig. With the above, fairly well established.

Corydalis claviculata DC. 105. Railway banks, east of Kyle of Loch Alsh.

Cochlearia anglica L. In plenty and quite typical by the tidal Peffery River at Dingwall,

Viola arvensis Murr. var. *derelicta* (Jord.). Oatfield near Conan.—*V. saxatilis* Schmidt var. *lepida* (Jord.). Roadside bank near Achilty Inn, growing among furze; named by Dr. E. Drabble.—*V. lutea* Huds. forma *amœna* (Symons). River shingles, roadsides, and fields near Garve; the type did not occur.

Cerastium semidecandrum L. Garve.

Sagina subulata Presl. Railway ballast, between Garve and Luichart Stations; in good quantity, with *Spergularia rubra* Pers.

Hypericum Androsæmum L. 105. Sparingly, near Kyle of Loch Alsh.—**H. humifusum* L. In sandy soil, near Achilty Inn.

Rhamnus Frangula L. Native in boggy ground at Loch Achilty; recorded for 106 in *Top. Bot.*, but only as perhaps planted. It appears to be very rare in Scotland.

Lathyrus montanus Bernh. var. *tenuifolius* Druce. Here and there about Garve; as usual, associated with the type.

An alien shrub, probably *Neillia opulifolia* (*Spiræa opulifolia* L.), is pretty well established in two or three spots by the river, near Conan; we also saw a good patch of *Spiræa japonica* Thunb. var. *Bumalda* Hort. on the large island, both being doubtless due to seed washed down from the gardens at Brahan Castle.

Rubus fissus Lindl., **R. suberectus* Anders., and *R. Rogersii* Linton are pretty frequent about Garve.

R. hirtifolius Muell. & Wirtg. var. *danicus* Focke. On railway banks near Kyle of Loch Alsh, *105, and abundant at Achterneed, *106.

Alchemilla alpestris Schmidt, was the only one of the "vulgaris" group noticed about Garve.

Rosa suberecta Ley. By far the most abundant rose, near Kyle of Loch Alsh and Garve, varying a good deal in the colour of the flowers and in the shape and clothing of the leaflets. All our gatherings were referred by Sudre to *R. pomifera* Herrm. var. *vogesiaca* Rouy; which, in his *Fl. de France*, Rouy only records from three stations in the Vosges and Isère.

Var. *glabrata* Ley. 105. Between Kyle of Loch Alsh and Duirinish, in two forms; one with deep rose-pink flowers and few subfoliar glands, the other white-flowered, its glands more numerous. Both are named by Sudre *R. Jundzillii* Bess. var. *trachyphylla* (Rau). According to Rouy, *l.c.* p. 344, this variety has ovoid-rounded or subglobose, hispid fruits; leaflets medium-sized, oval-elliptic, acute; branches rather strong, more or less prickly. He records it from the Vosges, Lorraine, and Alsace; and the geographical range of *R. Jundzillii* (*sensu amplo*) is from France eastwards, through Germany and Switerland. One would not, therefore, *primâ facie* expect it to occur in Scotland.

**R. dumosa* Puget. Near Achilty Inn; a form with white flowers, often streaked or tinged with pink. Leaflets almost eglandular beneath. Named by Wolley-Dod, and confirmed by Sudre, so far as the material (without fully formed fruit) allows of a determination.

**R. obovata* Ley? Garve. A remarkable plant, of dense, bushy habit; leaflets hairy, very glandular beneath, cuneate-obovate, imbricate, in three pairs besides the terminal one; prickles not very strong nor much curved; flowers small, deep rose-pink, tube naked; sepals at length erect; styles villous. "I think this is perhaps *R. tomentosa* var. *obovata* Baker. It is,

at any rate, one of those plants on the doubtful borderland between the *Coriifoliæ* and the *Tomentosæ* groups. The leaflets are smaller than in Baker's specimen, but quite as hairy above . . . " *Wolley-Dod in litt.* Mr. Ley's suggestion was "an extreme form of *R. Bakeri*"; but the weaker prickles and the habit distinguish it from that, and Sudre's comment: "*R. tomentosa* Sm., var. très curieuse," tends to confirm this view.

R. glauca Vill. var. **venosa* (Déségl.). Garve. Named by Sudre. Flowers deep pink; styles woolly; fruit globose; leaves with compound serration. This differs from var. *complicata* (Gren.) only by its very prominent secondary subfoliar nerves. Our plant is a very good match with Mr. Barclay's No. 17 from Buckie Braes, 88 Mid-Perth, Aug. 14, 1908, which was referred to *R. complicata* Gren. by Wolley-Dod in *Watson Exch. Club Report*, p. 185.

R. coriifolia Fr. var. *Bakeri* (Déségl.). Garve. Prickles strong, uncinate. Confirmed by Ley and Wolley-Dod. Sudre (who seems to be unfamiliar with our British critical forms) wrote: "A form of *R. coriifolia*, near var. *pseudo-cinerea* Rouy."

Pyrus latifolia Syme. The tree which E. S. M. found many years ago by the river near Conan is confirmed by Dr. T. Hedlund, the recent monographer of *Sorbus*, as *S. latifolia* Pers.; it is evidently of considerable age, about 40 feet high, with nearly the same spread of branches, and last year it fruited profusely. Not obviously planted; nor, indeed, is the somewhat dingy foliage particularly ornamental: still, the occurrence of only a single specimen, so far away from its Continental headquarters (France, south-west and central Germany), is decidedly against its being ranked as a true native here.

P. Aria Ehrh. One tree near the river, Conan, just above the railway bridge, very possibly native. A very large tree was seen close to Garve Station, almost certainly planted.

P. scandica Asch. (*Sorbus scandica* Fr., *teste* Hedlund). Six trees, mostly in good flower and young fruit, were found over an area of about half a mile, near the head of Loch Garve; none of them had any appearance of being introduced, and at least three were in a situation which rendered this impossible. Being found wild in southern Scandinavia, it is, *primâ facie*, not unlikely to be indigenous in Scotland; and, after mature consideration, we believe that it is so in this station. One tree is fully 25 feet high, with a trunk 1 foot in diameter. We did not see it as a planted species in the neighbourhood; and we much doubt its having been long enough in ornamental cultivation to account for the occurrence of a specimen probably well over a hundred years old—the growth is slow. Anthers of a curious brownish pink. It much resembles *Sorbus arranensis* Hedlund (*P. scandica* Bab.).

P. Malus L. *α sylvestris* L. (*P. acerba* DC.). In aboriginal woodland near Loch Achilty. We had never before met with this in the Highlands; it seems to deserve the specific rank assigned to it by De Candolle.

Callitriche intermedia Hoffm. (*hamulata* Kuetz.). In Lochs Achanalt, Garve, and Luichart.

Peplis Portula L. Boggy ground near Achilty Inn; apparently rare, so far north.

Circæa alpina L. Garve; Conan.

Galium Witheringii Sm. 105. Near Duirinish. 106. Garve, Achilty, &c. This segregate, much commoner than typical *G. palustre* L. in Scotland and many English counties, should retain its specific rank, we believe.

Matricaria inodora L. var. **phæocephala* Rupr. 105. Coast, Kyle of Loch Alsh.

Petasites ovatus Hill. By the River Peffery, between Strathpeffer and Dingwall.

Hieracium.—Considering the general barrenness of the soil about Garve, a surprising number of rare species was found. The long northern face of Ben Wyvis, besides being part of a strictly preserved deer-forest (we are indebted to the owner for leave to explore it), presents an almost unbroken stretch of grassy slopes; the only good rocks thereabouts which we worked are those of the Beallach Corrie, above Loch Bealach-nan-Cuilean, where, at a height of 1800 to 2000 feet, several interesting species were obtained. The season was so abnormally backward that until the last few days of our visit (ending on July 27th) it was useless to attempt mountain-botany.

**H. anglicum* Fr. Glascarnoch River, below Aultguish Inn; rather weak forms, some of which closely approach var. *acutifolium* Backh., while others are more or less intermediate between type and var. *cerinthiforme* Backh.

H. langwellense F. J. Hanb. Glascarnoch River, and stream descending from Scuir Vuillin (Sgurr-a'-Mhuillin) to Loch Achanalt; scarce.

**H. iricum* Fr. Stream below Scuir Vuillin; about half a dozen plants.

H. lingulatum Backh. Allt a' Bheallaich, Strath Garve, descending below 1000 feet; the yellow-styled form.

**H. centripetale* F. J. Hanb. Beallach Corrie.

**H. rubicundum* F. J. Hanb. Common in Strath Garve; near Aultguish Inn. Probably both the type and var. *Boswelli* (Linton) occur.

**H. nitidum* Backh. Allt Giubhas Beg, near Aultguish Inn; stream below Scuir Vuillin.

**H. Carenorum* F. J. Hanb. A small subalpine form or state of this endemic species, previously known from only two or three places in the extreme north of W. Sutherland, was found in Beallach Corrie; it has phyllaries very porrect in bud, leaves slightly glaucous, and peculiarities of head-clothing which furnish a distinction from *argenteum* var. *septentrionale.*

H. argenteum Fr. *105. Duirinish, in small quantity. *106. River banks and shingles, Garve. Some tall, luxuriant specimens have two or more long, acute teeth on the leaves.

**H. hypochæroides* Gibs. var. *saxorum* F. J. Hanb. In pro-

fusion on the Raven Crag and adjacent rocky railway-cuttings, west of Achterneed Station. Heads large and handsome; leaves more or less truncate-based, often unspotted, as in our herbarium specimens from Wales. No form of this species has been previously recorded from Scotland.

**H. callistophyllum* F. J. Hanb. var. *cremnanthes* F. J. Hanb. Glascarnoch River; no doubt seeded down from the mountains, as the altitude is only about 700 feet, whereas in the Grampians we have seldom seen it below 2500 feet. A plant or two occurred on rocks in the River Blackwater, above Garve.

H. silvaticum Gouan var. *micracladium* Dahlst. Frequent. Streams near Aultguish Inn, in Strath Garve, and below Scuir Vuillin. In this district the leaves are often beautifully blotched or marbled with purplish-black; they might be called forma *marmorata*. A stylose plant from conglomerate rocks by the Conan River, below Torrachilty Wood, probably belongs here; the head-clothing is normal, but the foliage broader and much more dentate, perhaps owing to exposure.—Var. *subtenue* W. R. Linton. Streams in Strath Garve, below Scuir Vuillin, and near Aultguish Inn; just the same yellow-styled form which we recorded last year from the vicinity of Oykell Bridge and Inchnadamph.

**H. Pictorum* Linton. Glascarnoch River.

**H. rotundatum* Kit. Beallach Corrie, in some plenty; a satisfactory extension of its British range (it was only recorded from a few stations near Clova). The larger specimens well match that so named by Dr. Lindeberg, with a mark of certainty; some of the smaller ones have foliage longer in proportion, but differ in no essential particular.

**H. prætenerum* Almq.? Beallach Corrie. We have seen no examples of this very rare species, and Mr. Linton cannot definitely identify our plants; but in almost all respects they agree very well with his brother's description (*Brit. Hier.* 55–6) of the typical form from Sutherland. The inflorescence is very remarkable; heads two or three, solitary on peduncles which are occasionally as much as six inches long, the lowest starting from or above the middle of the stem. If not *prætenerum*, it is apparently a new species. There was nothing in the surroundings to suggest abnormality.

H. eustales Linton. Nowhere plentiful, though found in three places:—Allt Giubhas Beg, Beallach Corrie, and stream below Scuir Vuillin. Typical (*teste* Linton), and thus more satisfactory than our Inchnadamph and Oykell Bridge specimens.

**H. duriceps* F. J. Hanb. var. *cravoniense* F. J. Hanb. Streamlet below Loch Bhreach, near Garve; as usual, mostly stylose.

H. vulgatum Fr. var. *sejunctum* W. R. Linton. *105. Rocks and railway banks about Kyle of Loch Alsh and Duirinish; some of the specimens remind E. F. L. of the closely allied var. *subfasciculare* W. R. Linton. *106. Near Loch Luichart Lodge.

H. stictophyllum Dahlst. Rocks by the Blackwater River, above Garve; also (as a stylose form) below the Rogie Fall. At Oykell Bridge it occurs both in v.-c. 106 and 107.

H. strictum Fr. var. *opsianthum* Dahlst. By the river at Garve; just the Speyside plant from Kingussie, so named by the Lintons. *H. reticulatum* Lindeb. was seen in bud near the Rogie Falls; but no specimens were taken.

H. auratum Fr. Allt Giubhas Beg.

Taraxacum spectabile Dahlst. Common in the Garve district from quite low levels up to over 2000 feet, by streams and in damp, rocky places. Occasionally the leaves are nearly glabrous above; when typical they have numerous hairs on the surface.

Pyrola media Sw. Near Achterneed; Allt Giubhas Beg.—*P. secunda* L. By a shaded, rocky streamlet, near Garve.

Myosotis palustris Hill. Swamp near the head of Loch Garve, with large flowers.

Veronica scutellata L. 105. Near Kyle of Loch Alsh. 106. Near Achilty Inn.

Euphrasia brevipila Burn. & Gremli. 105, 106. Frequent, as are *E. gracilis* Fr. and *E. scottica* Wellst.

**Rhinanthus major* Ehrh. var. *apterus* Fr. 105. Sparingly in a meadow at Duirinish; a plant occurred with it which looked like a hybrid with *R. Crista-galli* (*minor* Ehrh.); also seen in quantity near the railway, not far from Glencarron Station. The colour of the flowers and general habit make this species readily distinguishable at some distance.

**R. borealis* Druce. Beallach Corrie. The transference of *R. Drummond-Hayi*, which is very near this indeed, and has a puberulous calyx, to *R.* (*Alectorolophus*) *grœnlandicus* by Ostenfeld, whom Mr. F. N. Williams follows, cannot be maintained; the large calyx of *grœnlandicus* is quite glabrous on its surface, and the foliage is very different, judging by a Shetland specimen received from Mr. Beeby. This character (the hairy calyx) is thoroughly constant.

Utricularia intermedia Drev. & Hayne. Subalpine bog (900 feet) near Loch Bhreach; two flowers were found, the first that we have seen in Scotland.

Pinguicula lusitanica L. Bog above Loch Luichart; very scarce.

Lycopus europæus L. Near Garve; also *Scutellaria galericulata* L., and *Ajuga reptans* L., with flowers unusually bright blue.

Scleranthus annuus L. Near Garve.

Ulmus glabra Huds. (*montana* Stokes). 105. Indigenous in many places along the Highland Railway in this vice-county. 106. Common near Garve, Conan, &c.

Betula alba L. (*verrucosa* Ehrh.). The beautiful form with weeping branches (*B. pendula* Roth) is abundant and very fine about Garve and Achterneed, and in the valley of the Conan River.

**B. alba* × *tomentosa*. Garve, in two different forms, both probably having *B. alba* f. *pendula* as one parent, and both good inter-

mediates. The first (E. S. M.'s No. 3381) has large leaves (recalling *alba*) and comparatively long, narrow catkins (here *tomentosa* preponderates); the second (No. 3382) produces smaller, shorter, proportionally broader, darker and glabrous leaves (pointing to a *tomentosa* var. *denudata* descent), and short, broad catkins, just like those of *alba*. The female catkin-scales have their lateral lobes subpatent or somewhat falcate-reflexed; the seed-wing is as broad as or exceeding its seed; and the terminal shoots are more or less verrucose, though rather less so than in *alba*. A short time before his death a recent (1909) number of *Botaniska Notiser* was lent by Mr. Beeby to E. S. M., containing a revision of the Scandinavian *Betulæ*; about twenty-seven alleged species are there enumerated, several of which doubtless occur in Britain; but, to judge by the descriptions and by analogy, some of these are almost certainly hybrids, as is the case with *B. alpestris* Fr. We mention this *en passant*, in order to call the attention of British, and especially of Scottish, botanists to the need of further studying our Birches, which are by no means properly worked out as yet.

B. tomentosa Reitt. & Abel (*pubescens* Ehrh.) var. *parvifolia* E. S. Marshall (*B. alba* var. *parvifolia* Wimm.). Garve. The tree from which our specimens were taken has smaller leaves and catkins than we had previously met with.—*B. nana* L. Common on the hills above 1000 ft.; usually barren, being closely browsed by the deer. A rocky gorge of the stream below Scuir Vuillin produced the finest bushes we have ever seen, up to four and even five feet in length, and fruiting freely. The seed-wing varies somewhat, being occasionally about half the width of its fruit.—**B. nana* × *tomentosa*. By a stream in Wyvis Forest, one mile east of the keeper's cottage at Garbad. A bushy little tree, seven or eight feet high, with fairly intermediate foliage; catkins shortly stalked, about the same size as in *B. nana*, their scales and seeds showing marked signs of its influence. It is nearest *B. alpestris* Fr.! from the base of Ben Loyal, W. Sutherland, of all our gatherings, and should perhaps be placed under that; but the leaves are on an average considerably larger, and more like *B. tomentosa* in colour, whereas the catkins are only half to two-thirds of the length. No doubt the parentage is *nana* (female) × *tomentosa* (male), as it grows a little below the level of the former, and above that (in this locality) of the latter.

Quercus sessiliflora Salisbury. Among native trees near Loch Achilty; leaves finely pubescent beneath, not auricled. We believe that it was seen near Kyle of Loch Alsh and elsewhere; but no specimens were collected.

Salix purpurea L. Banks of the river near Conan; to all appearance a true native.—**S. caprea* × *cinerea*. Roadside near Garve; the parents occur close by. Confirmed decisively by Mr. Linton, though a good deal of the *caprea*-like appearance was lost in drying.—**S. aurita* L. 105. Common about Kyle of Loch Alsh and Duirinish, and in Strathcarron.

Populus tremula L. 105. Frequent on rocky stream-sides

near the Highland Railway. 106. Very fine by the Blackwater, a little below Garbad, Strath Garve.

Orchis latifolia L. 105. Duirinish: Strathcarron. 106. Garve.—*O. ericetoram* Linton. 105–6. Very common; we saw no other *maculata* form.

**Habenaria conopsea* Benth. 105. Duirinish, &c.—*H. virescens* Druce (*chloroleuca* Ridl.). 105. Duirinish. 106. Near the west end of Loch Garve, with plenty of *H. bifolia* Br.; but a careful search revealed no intermediates.

Luzula multiflora DC. 105. Near Kyle of Loch Alsh; also *L. campestris* DC. 106. Garve, &c.

Sparganium affine Schnizl. 105. Pool at Kyle of Loch Alsh. 106. North end of Loch Luichart.—**S. minimum* Fr. 106. Swampy ground near Loch Bhreach.

Triglochin palustre L. 105. Near Kyle of Loch Alsh; also *Potamogeton polygonifolius* Pourr., and *Scirpus cæspitosus* L.

**Scirpus fluitans* L. Achanalt.

Carex dioica L. Moorland near Garve.—*C. pulicaris* L. 105. Kyle of Loch Alsh; also *C. echinata* Murr. and **C. leporina* L. (*ovalis* Good.).—*C. canescens* L. Garve.—**C. limosa* L. Moorland near Loch Bhreach, Garve.—*C. panicea* L. 105. Kyle of Loch Alsh.—*C. sylvatica* Huds. Woods near Garve.—*C. binervis* Sm. 105. Strathcarron.—*C. fulva* Host (*Hornschuchiana* Hoppe). 105. Kyle of Loch Alsh.—*C. Œderi* Retz. Shore of Loch Achanalt.—*C. inflata* Huds. (*ampullacea* Good.). 105. Seen from the train in several places.—**C. inflata* × *vesicaria*. Growing, with plenty of the parents, in a marsh on the large island near Conan; a good intermediate, evidently sterile. Mr. Arthur Bennett, who agrees to our determination, gives as a synonym × *C. Pannewitziana* Figart, adding that, in his opinion, the Cheshire *C. involuta* Bab. "is hardly a hybrid, as plenty of ripe fruit is found on it." *C. vesicaria* was seen in two other stations some miles higher up the river, below Torrachilty Wood.

Agrostis canina L. 105. About Kyle of Loch Alsh and Duirinish; also *Deschampsia cæspitosa* Beauv. *D. setacea* Richter (*discolor* R. & S.) is locally plentiful in a very wet peat-bog, between Achilty Inn and the Conan River.

Molinia cærulea Moench. 105. Kyle of Loch Alsh, &c.; common.

Melica nutans L., auct. Only seen at one spot near Garve; associated with *Pyrola secunda*, as we have found it on two or three other occasions.

Poa nemoralis L. var. *divaricata* Syme. Rocky hill near Garve, together with *Polystichum aculeatum* Roth.

Glyceria fluitans Br. 105. Kyle of Loch Alsh. 106. The var. *triticea* Fr. was seen in marshes near the head of Loch Garve, and at Achanalt.

Asplenium Adiantum-nigrum L. 105. Near Kyle of Loch Alsh; one small specimen of **Phyllitis Scolopendrium* Newm. was noticed, growing on the rock of a railway cutting, about a mile from the terminus.

Cystopteris fragilis Bernh. var. *dentata* Hook. Not uncommon about Garve; type not seen.

Lastrea Filix-mas Presl var. *paleacea* T. Moore. Abundant and characteristic over a limited area near Garve.

Chara fragilis Desv. Near Loch Bhreach, Garve; probably var. *delicatula* Braun, but in shabby condition.

SHORT NOTES.

Carex divulsa × vulpina. — On page 101, Mr. Druce writes:—"It seems that for the present we must question the occurrence of *C. divulsa* × *vulpina* for Britain." I can decidedly answer this query in an affirmative sense, at least as regards the plant discovered by Mr. Shoolbred and myself in a damp wood, about a mile east of Portskewett, v.-c. 35 Monmouth, on July 3rd, 1902 (my No. 2763). Three strong roots were seen, growing with the parents, and quite intermediate. My own herbarium-specimen bears some well-formed fruits, which are smaller and shorter-beaked than in *vulpina*, but show evident traces of that species; the spikelets are rather small, numerous (7 to 9), and interrupted, but less distant than in *divulsa*, and with many more flowers, forming spike 2½ inches long; glumes hyaline, silvery-white, with a pale-green midrib, and considerably broader than those of *divulsa*; apparently sterile. I have a sheet of Mr. Towndrow's collecting, from Newland, near Malvern, gathered on June 29th, 1885, and comprising two specimens, which are quite different from one another. The first and more advanced one has four large, broad, large-fruited spikelets, and I believe it to be *C. vulpina* L. var. *nemorosa* (Rebent.). The second (in flower only) is much more slender; it has eight small spikelets, and, though less advanced, closely resembles the Portskewett gathering. Evidently a mixture was collected, which included the true hybrid.—Edward S. Marshall.

Zannichellia gibberosa in South-West Surrey. — Mr. Druce kindly confirms my suggested naming, as above, for a plant which occurred plentifully, and was, doubtless, native, in a small roadside pond near Park Hatch, Hascombe, on July 24th, 1894. A good critical botanist thought that it might possibly be *Z. aculeata* Schur, in Oest. Bot. Zeit. p. 203 (1870); which, if really a different form, should be searched for in Britain. Mr. W. H. Beeby called my attention to the fact that, whereas most of the fruits were strongly muricate both in front and behind, some were only crenate-margined; and truly remarked that we had much to learn about this genus. I am inclined to think that the spines are, as a rule, only produced (in those species which bear them) on fruits which are nearly full-grown.—Edward S. Marshall.

Zannichellia gibberosa Reichb. as a British Plant.—In this Journal for February (p. 55) Mr. Druce reports this plant

from the Fen ditches of Northants last September, and also from Berkshire in semi-brackish ditches in 1891; and he remarks that there are no British examples in the British Museum Herbarium or at Oxford. Mr. C. E. Britton has since (Journ. Bot. 1910, p. 77) reported it from Surrey. A correspondent asks why I do not claim the discovery in Britain of *Z. gibberosa*, for the Watson Bot. Exch. Club Report for 1888–1889 (p. 8) shows that specimens collected by me in the Bridgwater and Taunton Canal (Somerset) were thus named by Mr. Arthur Bennett. This is true, but as the four or five species of *Zannichellia* are scattered more or less throughout the globe, I do not attach much importance to any of these finds. The canal in Somerset is connected with the tidal river Parrett, though for many years the traffic has been small; so that Potamogetons, Myriophyllums, Charas, and many other water-plants are in profusion. As in the Surrey station, *Scirpus maritimus* is frequent in the neighbourhood, and so is *S. Tabernæmontani*.—H. Stuart Thompson.

Lecanora mougeotioides Schaer. in Britain.—On looking over some old letters I found one from Mr. Charles Larbalestier, dated Dec. 9th, 1879, from which I now give an extract:—"Your No. 4, from Fairlight Undercliff, Dec. 27th, 1877, is nothing more or less than the beautiful *Lecanora mougeotioides* of various Continental authors. It has been published by Schaerer and Anzi, and others besides. Fortunately, the larger specimen of the two has the characteristic *effigurate border* of the thallus. It is a good addition to our Lichen Flora." I do not know what has become of the specimens sent to Mr. Larbalestier. I have not found any more. I do not think this species has been recorded as British except in our *Natural History of Hastings and St. Leonards*, First Supplement, 1883. I hope this pretty species may soon be re-discovered in Britain.—E. N. Bloomfield.

[Found chiefly in mountainous localities in Central and South Europe, and determined by A. Zahlbruchner (Engler and Prantl Pflanzenf. ii* p. 233 (1907)) as a species of *Rinodina* on account of the 2-celled brown spores, and as synonymous with *R. oreina* Wainio. It is a conspicuous plant, with a somewhat lemon-yellow thallus, variegated with black, and with a distinctly outlined border. Nylander (Flora, lv. p. 364 (1872) considered it distinct from *R. oreina* on account of the reaction with caustic potash which, in the latter, gives no coloration, while in *L. mougeotioides* there is a distinct yellowing of the surface and medulla of the thallus.—A. L. S.]

Abnormal Carex acuta L.—In July, 1909, I found on the Severn banks, near Tewkesbury, flowering specimens of *Carex acuta* which showed various abnormalities. Many of the female flowers bore, on the abaxial side of the ovary, a slender stalk which arose from the base of the utricle and passed out through its mouth side by side with the stigmas. In the majority of cases this stalk then bore a bract on its abaxial side and another utricle containing an ovary. In one case, however, two utricles

were borne in succession, each in the axil of a bract; in another, three; while in two other instances a series of five female flowers was produced, followed by several normal males. These abnormalities were confined to the base of the spikelets. This observation is similar to that made by Wigand in *Carex glauca* (Flora, 1856, p. 707); and extends that of Wesmael (Bull. Acad. Roy. Belg. sér. ii. vol. xv. p. 544, 1863), who figured in *C. acuta* a proliferous utricle bearing two female flowers and a terminal bract.—R. H. Compton.

The "Struggle for Existence."—As an illustration of the "struggle for existence," the efforts made by a small plant of Wallflower may be worth recording. It was observed, in February, growing on the top edge of some wooden partitions stacked in a yard here (Newport, Isle of Wight), and, on moving the partitions, the roots of the plant were found to have descended eight feet in the narrow space between two of the partitions before reaching the earth. As an effort in another direction, also evidencing a similar struggle, I may mention a shoot of a bramble which I found this spring in my garden, extending fifteen feet before it found a suitable spot for its rooting end to establish itself.—Fred. Stratton.

Isle of Wight Plants.—On the 18th September last year I went with Mr. Hunnybun to the station for *Clinopodium grandiflorum* O. Kuntze, and we found it fairly abundant, and in good flowering condition. I was even more pleased to find that *Cyperus longus* L. was still maintaining existence at Apes Down, notwithstanding some attempt at draining the small bit of moory ground in which it grows. Mr. Hunnybun was able to obtain one or two fine specimens. This station was first noted just seventy years before by Dr. Bromfield, who, under the date, 10th August, 1839, states that it was growing there "sparingly." Another instance of a successful "struggle for existence."—Fred. Stratton.

Salicornia appressa Dum. in Cornwall.—Whilst at Par, E. Cornwall, at the end of August, last year, I gathered a *Salicornia*, which the Revs. E. S. Marshall and E. F. Linton have kindly verified as *S. appressa* Dum. This species has not previously been recorded farther west than Somerset and Dorset.—R. H. Goode.

John Snippendale.—Prof. Trelease writes from the Missouri Botanical Garden: "Our copy of Bauhin's Prodromus, of 1620, has marginal annotations, apparently made when it was new. The owner inscribed his name on the titlepage as Johannes Snippendale. Can you tell me who Snippendale was? What sort of a garden he had?—because he evidently was an ardent cultivator of plants—and when he lived, and what he did?" We have never heard of Snippendale. Can any of our readers supply any information?

Beta maritima in S. E. Yorkshire (p. 111). — Several correspondents, including the author of the note so headed, write to point out that the locality, "Scarborough Castle," is well known for this plant, and recorded in Mr. J. G. Baker's *North Yorkshire*; also that, in any case, it is not in South-east but in

North-east Yorks. It is only too clear, as we have more than once pointed out, that more care is needed in recording county or vice-county records as "new," as well as with regard to the limits of their boundaries.

REVIEW.

The Book of Flowers. By KATHARINE TYNAN & FRANCES MAITLAND. 8vo, pp. xii. 316. Price 6s. net. Smith, Elder & Co.

THE compilers of this prettily got-up volume tell us in their introduction that it "makes no pretence at all to completeness or to scientific knowledge or accuracy." Completeness in such a volume one does not expect, but it is not unreasonable to assume that it will, so far as it goes, be accurate. The ladies had a charming subject, and one on which there was—and alas! still is—room for a volume in which it should be adequately treated. Folk-names, folk-lore, legend and poetry, would all lend themselves to its compilation, and of this the authors are fully conscious. They have brought these together from numerous sources, and if their volume had been submitted to a competent botanist it might at any rate partly have filled the vacant place. As it is, their book will, we fear, tend to increase the number of inaccurate compilations from which indeed it is itself partly derived.

The very first page is startling, for this "Book of *Flowers*" begins with Adder's Tongue (!), and we note here and throughout that the specific names mostly begin with a capital letter. There are many misprints, especially in the quotations; but it is in the derivations proposed for the popular names that the book is most misleading: a wide experience of what can be done in this direction has not prepared us for anything so daring in the way of guess-work as can be found in this volume. One example, taken literally at random, exhibits both this and the too frequent inaccuracy of the citations: "French Lavender was known as Stæctiades, 'growing,' Lyte tells us, 'in the Isle called Stæctiades (or did the plant give the name to the Island, we wonder?) standing directly over against Marseilles.' In England it was known as . . . Cassidonie. Cassidone, or Cassidonie, became for some reason or other, perhaps from its namesake and sister being used as a 'strewing-herb,' Cast-me-Down. Cassidonie was derived from Cassia. . . . . Slic-a-Dove (Sleek?) is another old name for the plant; and perhaps from that name comes 'Dove-in-the-Ark' for the Lavender sweet-heads" (p. 167). Now Lyte calls the plant *Stæchados* and the islands (the Hyères) Stæchades (from their standing in a row) and gives *Sticados* as the Italian name, of which Gerard gives Steckado and Stickadone as forms; the latter also calls it Cassidonie, adding: "Some simple people imitating the same name do call it Cast-me-downe." "Slic-a-Dove" and "Stæctiades" appear for the first time in the volume before us; the suggestion as to "the island" taking its name from the plant, and the extraordinary gloss "Sleek?" (which explains nothing)

for the invention "Slic," are also due to the ingenuity of the authors, as well as the connecting of Cassidonie with Cassia, for which suggestion there is absolutely no ground:* and what are "Lavender sweet-heads"? Almost every page yields material of this kind for criticism.

We find in the book a number of vernacular names, for the most part unlocalized, which we have not met with elsewhere; but the entirely uncritical attitude of the compilers deprives these records of any value. We do *not* find, however, in the acknowledgement of works quoted any reference to the *Dictionary of English Plant-names*, which is the more surprising in that it has evidently been laid under contribution. It is regrettable that so pretty a book should be so inaccurate and misleading.

BOOK-NOTES, NEWS, &c.

Jul. Glowacki, of Marburg, has recently published "Die Moosflora der Julischen Alpen" (in Abh. K. K. Zool. bot. Gesellsch. Wien, Band v, Heft 2, 48 pp. Jena: G. Fischer. 1910. Price M. 1·80), in which he has gathered together all known moss-records for the district, with exact localities and altitudes. The totals are one hundred and ten species of Hepaticæ, and four hundred and fifty-nine Mosses, and numerous varieties. Two new moss-species are described. The author has himself frequently made large collections in the Julian Alps. The more important of the earlier collectors were Sendtner, Breidler, and Sáfer, and, more recently, Loitlesberger. The list should be of great use to local botanists.—A. G.

The general get-up of Mr. Harold A. Haig's manual on *The Plant Cell*, which forms one of Messrs. Griffin's Scientific Text-book series, is not attractive; it suggests the examination method made familiar by certain series associated with science by correspondence. The book, however, is more interesting than it looks, and if used as an adjunct to the practical study of plant structure should prove a helpful guide to an elementary student. The author sets out as subjects for study, first the nature and reactions of protoplasm, then the living assimilating cell, and then the more important cell-tissues of the higher or vascular plants. A chapter is next given to some forms of cells occurring amongst the lower plants, and this is followed by the study of cell-division. Reproductive cells are also considered, and the final chapter deals with chemical and physiological studies in connection with the cell. The numerous illustrations in the text, which are clear and diagrammatic, occupy a considerable proportion of the space; there are also some good photo-micrographic reproductions. The price of the volume is 6*s*. net.

Erratum.—P. 107, line 8, for *Trichophila* read *Trichopilia*.

---

* It may be noted that Prior's derivation, which he takes from Skinner, that this is a corruption of "Stoechas sidonia, from Sidon, where the plant is indigenous," is equally futile, as the plant never seems to have borne that name.

Macmillan's Books on Botany

NOTES of a BOTANIST on the AMAZON and ANDES. Being Records of Travel during the Years 1849–1864. By **RICHARD SPRUCE**, Ph.D. Edited and Condensed by ALFRED RUSSEL WALLACE, O.M., F.R.S. With Illustrations and Maps. 2 vols. 8vo. 21*s.* net.

A TEXT-BOOK of BOTANY. By Dr. E. **STRASBURGER**, and Others. Third English Edition, Revised with the 8th German Edition. By **Dr. W. H. LANG**, M.B., D.Sc. 8vo. 18*s.* net.

THE ORIGIN of a LAND FLORA. By Prof. **F. O. BOWER**, Sc.D., F.R.S. Medium 8vo. 18*s.* net.

THE STUDENT'S FLORA of the BRITISH ISLANDS. By **Sir JOSEPH HOOKER**, F.R.S. Gl. 8vo. 10*s.* 6*d.*

A UNIVERSITY TEXT-BOOK of BOTANY. By **Prof. D. H. CAMPBELL**, Ph.D. 8vo. 17*s.* net.

THE STRUCTURE and DEVELOPMENT of MOSSES AND FERNS. By **Prof. D. H. CAMPBELL**, Ph.D. 8vo. 18*s.* 6*d.* net.

BOTANICAL TEXT-BOOK. Vol. I.—**Structural Botany:** or Organography on the Basis of Morphology. To which is added The Principles of Taxonomy and Phytography, and a Glossary of Botanical Terms. By **ASA GRAY**, LL.D. Sixth Edition. 8vo. 10*s.* 6*d.* Vol. II.—**Physiological Botany.** I. Outlines of the History of Phaenogamous Plants. II. Vegetable Physiology. By **G. L. GOODALE.** 8vo. 10*s.* 6*d.*

FLOWERS, FRUITS, and LEAVES. By Lord **AVEBURY**, F.R.S., D.C.L. Illustrated. Cr. 8vo. 4*s.* 6*d.* [*Nature Series.*

NOTES on the LIFE HISTORY of BRITISH FLOWERING PLANTS. Illustrated. By **Lord AVEBURY**, 8vo. 15*s.* net.

ON BRITISH WILD FLOWERS, Considered in Relation to Insects. By **Lord AVEBURY**, F.R.S., D.C.L. Illustrated. Cr. 8vo. 4*s.* 6*d.* [*Nature Series.*

A TEXT-BOOK of BOTANY for SCHOOLS. By **Prof. L. H. BAILEY.** Cr. 8vo. 6*s.*

LESSONS with PLANTS. By Prof. L. H. Bailey. Cr. 8vo. 7*s.* 6*d.*

MACMILLAN AND CO., LTD., LONDON.

FUNGI AND HOW TO KNOW THEM

An Introduction to Field Mycology

By E. W. SWANTON

Member of the British Mycological Society.

With 16 Coloured and 32 Black and White Plates.
Crown, 8vo. 6s. net.

This book is in two parts. The first deals with Growth, Parasitism, Spore Dispersal, &c.: the second contains full descriptions of the numerous species—upwards of two hundred—figured in the plates. There are Analytical Keys to the Genera, and an exhaustive chapter on Collecting, Exhibiting, and Preserving Fungi.

METHUEN & CO., Ltd., 36, Essex Street, London, W.C.

JUST PUBLISHED. **PRICE 6s. NET.**

With 35 Photo-Micrographs and over 100 *Drawings, the whole of which have been specially prepared for this work by the Author.*

THE PLANT CELL

ITS MODIFICATIONS AND VITAL PROCESSES.

By HAROLD A. HAIG, M.B., B.S. London

(Late Bucknill Scholar, Univ. College, London).

CONTENTS.—Introduction—The Nature and Reactions of Protoplasm—The Study of a Living Assimilating Cell—Cells of the External Tissues and certain supporting and Protective Tissues in Plants—Meristem—Vascular Tissues—Isolated Tissues or Cells having a special Function—Cells occurring amongst lower Plants—Cell-Divisions—Reproduction—Chemical and Physiological Studies in connection with the Cell—Appendix—Index.

LONDON: GRIFFIN & Co., Ltd., EXETER STREET, STRAND, W.C.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of January and February (Double Number). — Recent Advances in the Study of Heredity. Lecture VII.—Cytological and other Evidence relating to the Inheritance of Sex. Lecture VIII.—Theory of Ancestral Contributions in Heredity, by A. D. Darbishire. The Fundamental Units of Vegetation, by C. E. Moss. On the Causes of the Zoning of Brown Seaweeds on the Seashore, II. (Text-fig. 1), by Sarah M. Baker. The Inheritance of Peloria and Flower Colour in Foxgloves (*Digitalis purpurea*) (Text-fig. 2), by Frederick Keeble, Miss C. Pellew and W. N. Jones. Notes on Recent Literature: Professor Wille on the Classification of the Green Algæ, by R. P. G.

Subscription-Price, 15*s. per annum* (*ten numbers*) *post free.*
Price of single number, 2*s.* *Price of double number*, 4*s.*

Published Monthly by the Editor, The Botany School, Cambridge.

Subscriptions to the Journal of Botany (16s. post free) for 1910 should now be sent to West, Newman & Co.

No. 570 JUNE, 1910 Vol. XLVIII

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

On some Irish Forms of *Fissidens*. (Plate 505.) By H. N. Dixon, M.A., F.L.S. 145

New Potamogetons. By Arthur Bennett 149

Notes on the Flora of Cheshire. By E. & H. Drabble 152

Some Madeira *Hepaticæ*. By Eleonora Armitage 156

The Genus *Euclea* in Australia. By W. P. Hiern, M.A., F.R.S. .. 158

George Stabler. (With Portrait.) By C. H. Waddell 160

Short Notes. — *Lepidium heterophyllum* L.—*Carex divulsa* × *vulpina* — Some New County Records of *Sphagna* — *Viola Foudrasi* Jord. in Somerset— *Salsola Kali* L. var. *tenuifolia* Moq.-Tand. — *Barbarea stricta* Fries—*Lathræa Squamaria* L. 162

Reviews:—

Agricultural Botany, Theoretical and Practical. By John Percival, M.A., F.L.S. 165

Lincolnshire Plants 166

Book-Notes, News, &c. 167

Supplement.—The British Roses. By Major A. H. Wolley-Dod (continued).

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

THE JOURNAL OF BOTANY was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to WEST, NEWMAN & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had price 1s. 6d. each.

AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the JOURNAL OF BOTANY. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

2 pages	25 copies	4s.	4 pages	25 copies	5s.	8 pages	25 copies	8s. 0d.
,,	50 ,,	5s.	,,	50 ,,	6s.	,,	50 ,,	9s. 0d.
,,	100 ,,	7s.	,,	100 ,,	8s.	,,	100 ,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

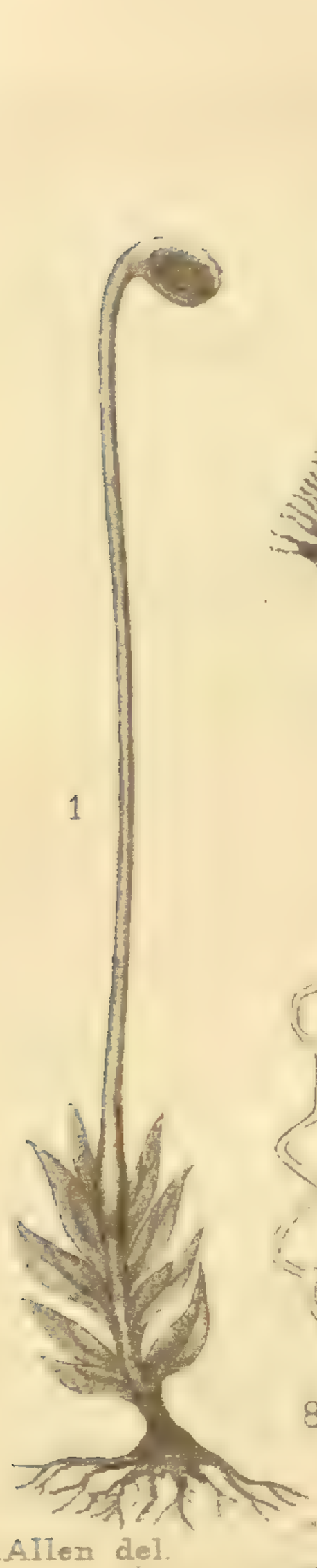
Assisted by the Staff of the Cambridge Botany School.

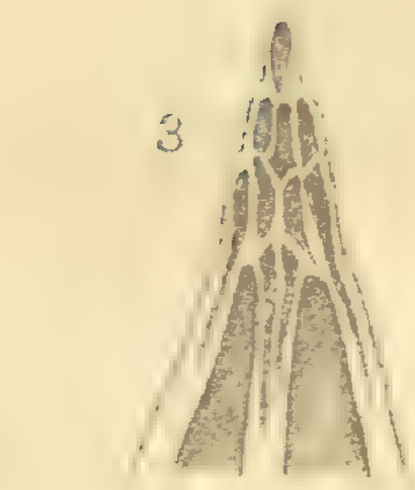
Contents of March and April (Double Number). — The Inter-Relationships of the Bryophyta. I—Sphærocarpales. II.—Marchantiales (Figs. 1–17), by F. CAVERS. The Woodlands of England, by C. E. Moss, W. M. RANKIN, and A. G. TANSLEY. Note on the Roots of *Terminalia arjuna*, Bedd. (Text-figs. 3–7), by R. S. ADAMSON.

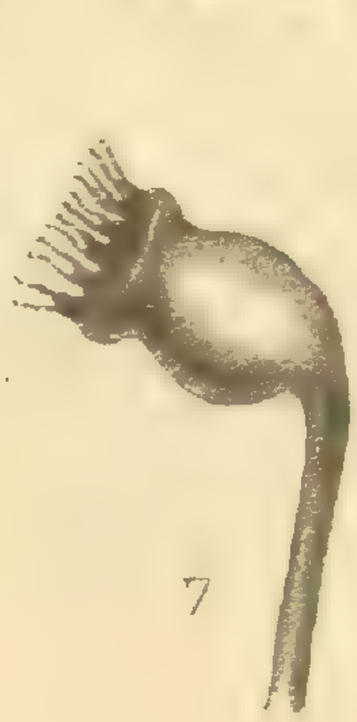
Subscription-Price, 15s. *per annum* (*ten numbers*) *post free.*

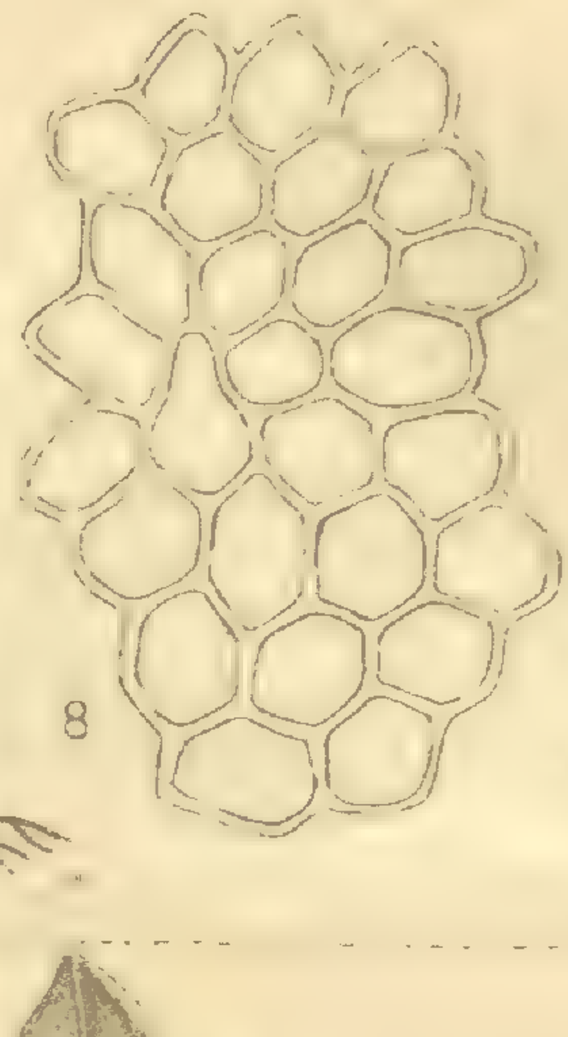
Price of single number, 2s. *Price of double number*, 4s.

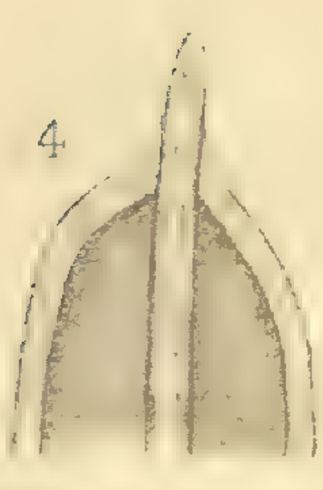
Published Monthly by the Editor, The Botany School, Cambridge.

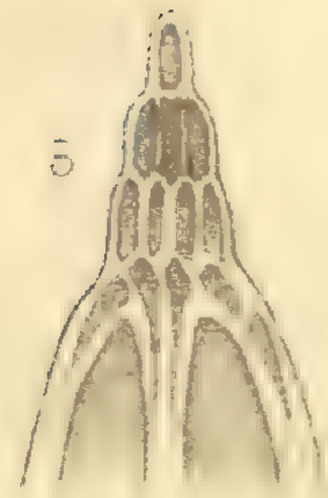


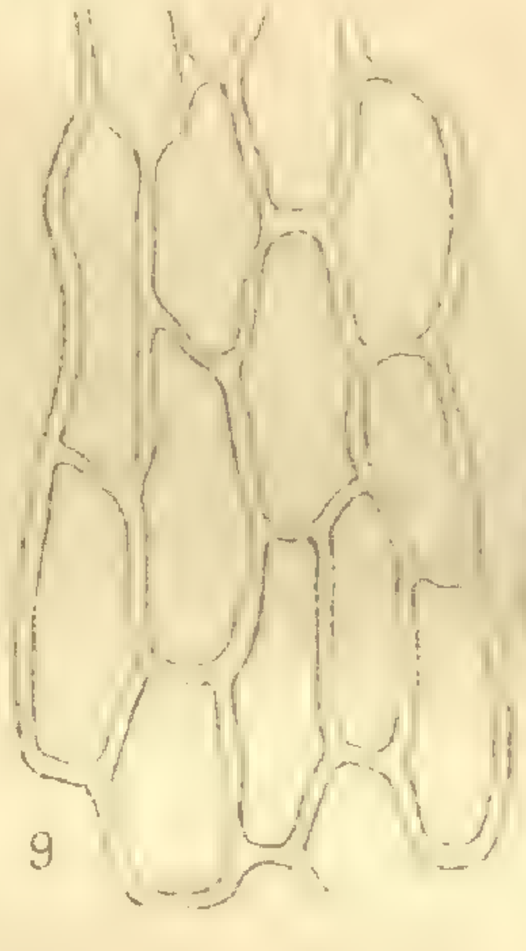


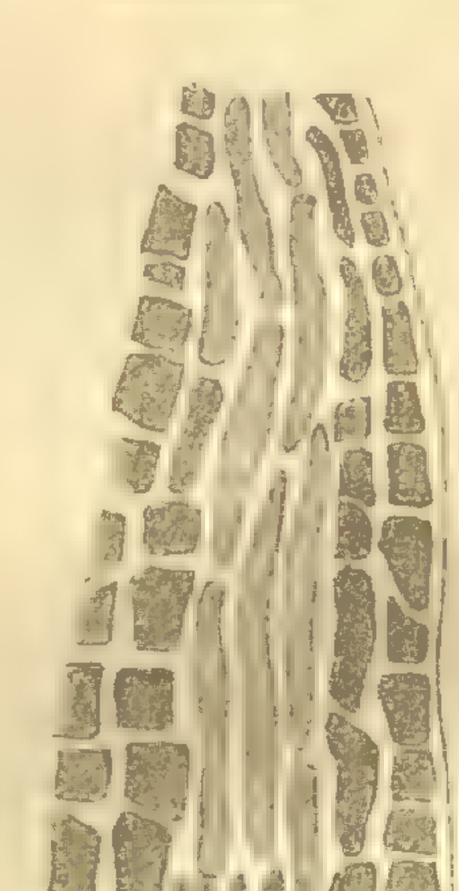












W.N. Allen del.

P. Highley lith.

West, Newman imp.

1-10 Fissidens exsul *Dixon.*
11-15 Fissidens rufulus *B. & S.*

ON SOME IRISH FORMS OF *FISSIDENS*.

By H. N. Dixon, M.A., F.L.S.

(Plate 505.)

(A.) Fissidens exsul, sp. nov.

The genus *Fissidens* would almost seem to have a special affinity for the neighbourhood of Dublin. One of the most interesting discoveries of the late D. Orr was that of the little species of *Fissidens* described by Lindberg (Rev. Bry. 1880, 97) as *Schistophyllum Orrii*; but later on recognized by Mitten to be identical with his *F. tequendamensis* from the Andes, described in the Musci Austro-Americani (in Journ. Linn. Soc. Bot. xii. 601).

Towards the close of 1909 Mr. D. McArdle sent me a small *Fissidens* from the Palm House in the Botanic Gardens, Glasnevin, Dublin, which on examination showed a striking resemblance to *F. tequendamensis*, with, on the other hand, some marked differences. The generally tapering and acute leaves, the form and dimensions of the leaf-cells, and especially the form of capsule, were identical with the characters of *F. tequendamensis*. On the other hand, the plant was larger and more luxuriant, the leaves larger, broader, and more numerous, the seta longer, and especially the cells were densely and richly chlorophyllous, so that the leaves were deep green and opaque instead of pallid and pellucid, as is the case with *F. tequendamensis*, where the cells are almost entirely free from chlorophyll grains. If this character stood alone, I should have been inclined to discount its value, and to suppose that the special conditions of growth—warmth, shade, and abundant moisture—might be held to account for the richness of chlorophyll and more luxuriant growth. Further examination, however, revealed certain other characters of importance. The male flowers in *F. tequendamensis* are attached to the base of the fertile stem by rhizoids (*i. e.* the inflorescence is rhizautoicous); in the plant under notice, while this form of inflorescence occurs, I have also found distinct male plants with terminal flowers, so that the inflorescence is at times, at least, dioicous. It is, however, in the peristome that the principal character of importance was found. The basal part of the peristome in *Fissidens* usually shows prominent transverse bars on one or both surfaces, principally on the inner or ventral face. In most species of the genus their development is of the normal character common to many mosses. In a small group of exotic species, however (sect. Pycnothallia C. M.), the lamellæ of the inner surface are developed in a manner and to a degree scarcely, I think, paralleled in any other kind of moss. They are described by Brotherus (Engler & Prantl, *Pflanzenfamilien*, *Musci*, p. 355) as "kammförmig," and are figured by him, after Dusén, on the same page. The Glasnevin plant exhibits precisely this structure of peristome. Mr. Allen's figure (Plate 505, fig. 10) will perhaps give a clearer idea of the

structure than a description can do; briefly it may be said that the lamellæ reach, compared with the size of the tooth, a great elevation, and terminate, each one, in a fringe of delicate ciliate branches.

Unfortunately I have not been able to determine whether, or to what extent, this character is exhibited by *F. tequendamensis*. Mrs. Britton kindly sent me a specimen of Mitten's original plant, as well as of *F. Orrii* (accompanied by the following note:—"The *Fissidens* that you send is certainly not *F. tequendamensis*, as you will see by the specimen I send, because the leaves are much *wider* and *larger* in every way, neither is it *F. Orrii*, of which I find a few plants in Mitten's collection"); but neither contained a capsule, and I have not been able to examine the peristome of either the South American or the Irish plant. Lindberg, in his very full description of *S. Orrii*, describes the peristome teeth as "et extus et intus densissime trabeculati"; from which lack of any reference to the peculiar structure under consideration its absence in the case of the Irish *F. tequendamensis* might be presumed. Unfortunately this can hardly be considered a safe deduction. The cristate internal lamellæ are particularly difficult to observe; in the dry state the teeth are extremely fragile, and it is scarcely possible to dissect a peristome in this condition; whilst in the moist state the teeth bend inwards and double back upon themselves so strongly as to be almost entirely sunk within the orifice of the capsule, and can only be observed by careful dissection. Moreover, the elevated and cristate nature of the lamellæ is not perceptible when the ventral surface of the tooth is examined directly; it only becomes so when the tooth is viewed laterally, *i. e.* in profile, as figured on Plate 505.

The possibility of this structure having been overlooked, while yet present in *F. tequendamensis*, even by so acute an observer as Lindberg, is supported in rather a remarkable way by the fact that it does occur, and yet has been hitherto entirely overlooked in another and much better known species, *F. algarvicus* Solms. I am indebted for this observation to Mr. W. E. Nicholson, whose attention I drew to the cristate lamellæ in the Glasnevin species. On examining the peristome of *F. algarvicus* for comparison, Mr. Nicholson, to his surprise and my own, found an almost identical structure there. The lamellæ are a shade less elevated, and the ramifications are somewhat shorter and less delicately ciliate, but essentially the structure is the same.

Apart from the presence or absence of this structure in *F. tequendamensis*, at present undecided, the relationship of these three plants (*F. tequendamensis*, *F. algarvicus*, and the Glasnevin plant now under notice) is of a very curious and interesting nature. All three agree in having an acute, tapering leaf apex, and a lax and elongate basal areolation, characters which differentiate them from all the smaller European species of *Fissidens*; while at least two of them agree in possessing the very peculiar cristate lamellæ of the peristome teeth. Whether or not this structure occurs in *F. tequendamensis*—and I am inclined to anticipate its presence—

these three plants would seem to constitute a fairly well-defined group (to which of course some other exotic species now included under the section Bryoidium may be found to belong), characterized by the above features.

In any case, apart from the peristome, I incline to think the *tout ensemble* of characters referred to above sufficiently distinguish the Glasnevin plant, and I therefore propose for it the name of *F. exsul*. If it be objected that it is unlikely that two closely allied, yet distinct, exotic species should have arrived independently in the neighbourhood of Dublin, the objection must be admitted to have some weight; but the alternative suggestion appears to me almost equally improbable, *viz.* that *F. tequendamensis*, discovered by a river near Dublin in 1880, in minute quantities, and with all the characteristics of the species in its native habitat, should, after a disappearance of thirty years, reappear in palm houses in the botanical gardens at Glasnevin in abundance, under a quite different guise, with a new form of inflorescence, and showing a very distinct habit, colour, and structure—far more distinct, in fact, than any difference in the vegetative structure between *F. algarvicus* and *F. tequendamensis*, which, however, on several grounds are rightly, no doubt, held distinct.

Fissidens exsul, sp. nov. Polyoica; *vel rhizautoica vel dioica*, floribus masculis in stirpibus propriis terminalibus paucis. Terrestris, sat dense gregarius, *saturate viridis*, humilis, caulis fertilis 3–8 mm. altus. Folia *ad 16-juga* (plerumque circa 8–10-juga), magnitudine maxime variabilia, *1–2 mm. longa*, *·4–·5 mm. lata* (sæpe tamen minora), late vel anguste lanceolata, superne *sensim acutata*, *ad apicem plerumque valde acuta*, *interdum subobtusa mucronata*, toto ambitu *limbo valido* cincta, nervo valido cum limbo in unum confluente *in mucronem brevem validum acutum excurrente*. Lamina dorsalis basin versus sensim angustior, insertionem folii sæpe vix attingens. Areolatio *valde chlorophyllosa*, *opaca*; cellulæ hexagonæ 8–14 μ latæ, parietibus pro more tenuibus, sat firmis, basin versus et totius fere laminæ vaginantis *laxæ*, *elongate hexagono-rectangulares*, *magnæ*. Seta terminalis, gracilis, superne straminea, inferne rubra, *8–15 mm. alta*. Theca minuta, cernua, ei *F. tequendamensis* similis. Peristomium rubrum, dentes infra medium fissi, cruribus gracilibus, filiformibus, grosse papillosis, spiram prominentem optime exhibentibus; pars indivisa extus dense trabeculata, *intus lamellas peraltas* (altitudo circa dentis latitudinem æquans), *apice ciliato-cristatas* exhibens. Spori minuti, 6–8 μ, lævissimi.

Hab. "On the surface soil (loam) in pots and tubs where palms are grown in the Botanic Gardens, Glasnevin, Dublin"; Nov. 1909; leg. D. McArdle.

Differs from *F. tequendamensis*, and still more from *F. algarvicus*, in the larger size, more numerous, much larger and broader leaves, chlorophyllous cells, and longer seta. From *F. algarvicus* also in the stoutly excurrent nerve and cernuous, curved capsule. In general appearance it closely resembles *F. incurvus*, from which,

however, as from all our European species it differs radically in the leaf apex, areolation, and peristome.

(B.) Fissidens rufulus B. & S., *forma.*

In endeavouring to solve the problem of the relation between the Glasnevin *Fissidens* and the old *F. Orrii*, I was anxious to know whether by any possibility that plant might still be discoverable in its ancient locality, in and about the old quarry near Finglas Bridge. With this purpose Mr. McArdle and Mr. C. F. Allen (to whom I am indebted for the figures of *F. exsul*) made several excursions to the locality and carefully explored it, without finding any trace of *F. tequendamensis*. In the course of their search, however, a *Fissidens* of unusual appearance was met with on a calcareous clayey bank in one of the old quarries near the Tolka River, near Cardiff's Bridge, Finglas, in a spot which would frequently, if not usually, be submerged, and probably had been so for the preceding twelve months. This Mr. McArdle sent to me, and I at once recognized in it a very remarkable form or variety of *F. rufulus* B. & S.

The salient feature of *F. rufulus* is of course the stout cartilaginous border, often, as well as the nerve, coloured a deep bright red, and entirely surrounding the leaf, though often eroded away to some extent at the extreme apex. In the Finglas plant this border was frequently well developed, and then often exhibited the characteristic red colour; but more often, even on leaves from the same stem with others of the normal structure, it was much less developed, mostly quite uncoloured, and in some leaves almost wanting. I have figured four leaves showing various degrees of development of border: in (1) it is fairly normal and surrounds the leaf; in (2) it is well-marked on the sheathing and superior laminæ, while the inferior lamina shows only the faintest traces of it; in (3) it is entirely wanting on the inferior lamina, and does not reach the apex of the superior; while in (4) it is wanting on all but the sheathing laminæ, and is there much less strongly developed than usual. Nor does the arrest of development stop here. In certain of the leaves the border, even in the sheathing laminæ, is reduced to a mere trace, and in these cases it may occupy an intramarginal position; that is to say, the elongated pellucid cells are not actually marginal, but occupy an inner position, with 1 to 2 rows of the ordinary small chlorophyllous cells between them and the margin (*cf.* fig. 5). This intramarginal border is a characteristic and normal feature of certain exotic genera of mosses, and has been described in certain of the smaller species of *Fissidens* (e. g. *F. intralimbatus* Ruthe and *F. subimmarginatus* Philib.), but here, at any rate, its occurrence is quite exceptional and sporadic, and must be looked upon as entirely abnormal.

The departure from the normal structure of *F. rufulus* is so great that the identity of the plant might easily have been overlooked. I have hesitated as to giving it a varietal name, but the great variability of the leaves in respect to the border clearly

imply an unstable condition, and it is probably to be considered a form or state rather than a fixed variety. None the less, it is a very remarkable plant.

Explanation of Plate 505.

Fissidens exsul, sp. nov.—Fig. 1. Plant, × 5. 2. Leaf, × 50. 3, 4, 5. Leaf-apex, × 120. 6. Calyptra, × 30. 7. Capsule with peristome, × 10. 8. Upper cells, × 400. 9. Cells of sheathing lamina, × 400. 10. Peristome tooth, viewed in profile, ventral surface to left, × 300.

Fissidens rufulus B. & S , forma. Figs. 1–4. Leaves, × 25. 5. Part of sheathing lamina, showing intramarginal border, × 150.

NEW POTAMOGETONS.

By Arthur Bennett.

Potamogeton australiensis, sp. nov.—For some time scraps of a Potamogeton from Australia have been passed in review, but with no definite result. Lately Mr. Maiden, the Director of the Sydney Botanic Gardens, has sent me numerous unnamed Australian specimens. Among them a good sheet of what has passed for *P. coloratus* Hornem. var. *jamaicensis* Griseb., containing many specimens. On examination it became at once apparent they were not that plant, as some had floating leaves, and no form of *coloratus* is known with them—the Socotra plant I found so referred cannot be accepted as such. Although according fairly well in all other particulars, I have never seen any West Indian or Australian specimens with fruit. In this position it seems best to retain the name for the West Indian specimen, and to give a name to the Australian plant. When this can be studied *in situ*, it may be that some alterations in the descriptions will be needed.

P. australiensis mihi.—Caulis 1 m. longus, simplex. *Folia submersa* heterophylla, subpetiolata, nervis 7, inferiora linearilanceolata, 1 dm. longa, 5 mm. lata; intermedia 6·15 cm. longa, 2 cm. lata, nervis 11; superiora oblongo-lanceolata vel ovata, translucentia, petiolata in petiolo subcordato 15 nervis. *Folia emersa* coriacea, nervis interdum reticulato-venosa. *Stipulæ* semi-acutæ, 2 cm. longæ, striatæ. *Pedunculi* teretes, æquales, 6·15 cm. longi. *Spicæ* graciles, densifloræ. *Fructus* non visus.

With much of the habit and facies of *P. coloratus* this species produces floating leaves. In one specimen the passing of the submerged into the emersed is well seen, two-thirds of the leaf represented the structure of the emersed, one-third that of the submerged, showing well the provision for strengthening the leaf as soon as it has to provide against air, storms, &c. The reticulate areolation (like double inverted arches) is produced over the two-thirds, wanting with one-third. In this plant (as in *coloratus*) we have a great diversity of leaf-form, so much so that, seen apart, two, if not three, species might (with some excuse) be made of

these specimens. But the same structure runs through all the examples, both as to leaf and stem.

The leaf-margins of the upper leaves are strongly undulate (this may be the result of tension in drying), not denticulate or serrulate, showing under a $\frac{1}{4}$ in. only the faintest signs of minute cells outside the leaf-margin. As showing its likeness to *coloratus* the top right-hand leaf of the *English Botany* plate (ed. 3, t. 1401) might well have been drawn from one of Mr. Maiden's specimens.

Potamogeton semicoloratus, sp. nov.—*P. plantagineus* Ar. Benn. in Balfour's *Socotra*, non Du Croz. Caulis 6 dm. longus, simplex. Folia inferiora attenuata 15–17 nervis, translucentia, oblongo-ovata in petiolo 2 cm. longo, nervus medius reticulato-venosus, margine non denticulata. Folia superiora (emersa) semicoriacea lanceolato-ovata in petiolo 4–6 cm. longo, 19 nervis. Stipulæ sæpius deitritæ, 2 cm. longæ. Pedunculi 6·15 cm., 1 dm. longi, non æquales. Spicæ 2·5 cm., 3·15 cm. longæ.

Hab. Island of Socotra. In rivulis vallis Fatmæ prope Unset, Arab. Feb. 29th, 1836, *W. Schimper* n. 893 in herb. Delessert. In rivulis palmetorum vallis Fatme, fl. Feby., *L. Fischer* n. 100, Herb. Munich ex Dr. Solereder. I suppose this to be on the Red Sea seaboard of Arabia. This may be likened to *P. coloratus* with floating leaves, the Arabian specimens are, however, greener than *coloratus* usually is; on neither of the specimens is there any fruit. Mr. Fryer (Pot. Brit. Isles, p. 25) rightly doubted my reference of the Socotra specimens to *coloratus*.

Potamogeton brasiliensis Ar. Benn. in Journ. Bot. 1908, 163. *P. lucens* L. subsp. *brasiliensis* Ar. Benn. ex Graebner in Das Pflanzenreich. Heft 31, 79 (1907). *P. lucens* K. Schum. Fl. Brasil. 111 (1894) 713, t. 119, fig. 2.

Dr. Hägstrom has called my attention to the leaves of this plant of Gardner's n. 2756 from Brazil, saying that the leaves want the serrulate margins of the *lucens* forms. This is so, and the plant must stand as a distinct species.

The plant must be rare, as I know of only three specimens in our herbaria in Britain, and there is no record of any of the other Brazilian species being gathered in the Province of Piauhy, yet this is a settled province and a small one, extending from the sea coast at Cantagallo south to the Sierra de Piauhy in 10° S. lat. Of course in such a vast country as Brazil, and so little searched (comparatively), it may be much more frequent.

Potamogeton dissimilis, sp. nov.—*Caulis* fulvus, filiformis (c. 1 mm. crassus) 3–9 dm. longus, internodis 4–10 cm.–6 cm., foliis sæpe fasciculatis. *Folia herbacea* 4·35 dm. longa, ad 3 mm. lata, ad apicem rotundata-obtusa vel angustata, mucronata, 5-nervia ad folium basin, multis nervis rectangulariter dispositis. *Stipulæ* adnatæ ad 5 cm. longæ, apica libero ad 2 mm. longo, obtuso, viridulo. *Pedunculus* 2–5 cm. longus, filiformis. *Spicæ* 1–2 cm. longæ, paucifloræ (8–10) proximæ vel interruptæ. *Fructus* non visus.

Hab. Casa Bamba, Siena chica de Córdoba, Córdoba, Argentine Republic. January, 1909. *Dr. Teodoro Stuckert.* n. 19877 pro parte.

One of the most remarkable species of the section *Coleophyllii*, in habit much like one of the *gramineus* group; in fact, on first looking at the specimen, I mentally said, "near *P. Gayii*." A portion of a *graminifolius* species, *P. Berteroanus* Phil., is mixed with it, gathered by the collector, no doubt, as the same. Another specimen, under the same number, is *P. Berteroanus.*

It does not answer to the supposed varieties mentioned by Dr. Robbins,* where, speaking of the relations of his var. *latifolius* (of *pectinatus* L.), he compares the forms from the Great Lakes, to some of which the *dissimilis* conforms. Neither can it be placed with *P. striatus* Ruiz et Pavon (*P. pamiricus* Baagoe), or any other species known to me. To some extent it accords with specimens (wanting flowers or fruit) from South Australia, gathered by Mr. Tepper, but they seem to belong to *P. interruptus* Kitaib.

All the other species of this section agree mainly in the habit peculiar to the section; but this plant simulates in habit the *graminifolius* series, especially *P. Friesii* Rupr.

Potamogeton Henningii, sp. nov.—A specimen under the name of *P. zosterifolius* Schum. ("ex herb. horti Petrop. In stagnis prope sylvi L. Marian. leg. Henning"), gathered by Henning before 1823 in the Caucasus, is not that species.

The stem is half the usual thickness of *zosterifolius*, much less compressed, stipules half the length, 1·2 cm., and excurrent in a long point. Leaves 1 dm. long by 4 mm. wide, central nerves consisting of six closely compacted nerves, with numerous connecting nerves at right angles, two other major nerves, and six minor nerves (in *zosterifolius* there are four major nerves and twenty minor nerves); immature fruit much like that of *acutifolius* Link, but more winged on the central carina.

Henning published (Mem. Soc. Nat. Moscow, vi. (1823) 61–93) a paper entitled "Observationes de plantis tanaicensibus," in which he enumerated 934 Phanerogams.

In specimens of *P. zosterifolius*, "No. 1283, Wolf Lake, Indiana, U.S.A., *Mrs. Agnes Chase*, 1900," the fruit is very different from any figures given by Fieber, Reichenbach, Eng. Botany, Chamisso, or Morong. They more resemble *P. acutifolius* Link in many ways, and may perhaps come under Fischer's var. *sclerocarpus* "forma fructibus iis *P. acutifolii* similibus est."† In specimens of the fruit of *zosterifolius*, from its area of distribution there is, of course, some difference. In Japanese and Siberian examples the leaf-apex and general contour of the plant more nearly resemble *P. acutifolius*, while the majority of those of North America approximate more to the general run of European specimens.

---

* King's Geol. Expl., 40th Parallel, U.S.A. (1871), 338.

† In Ber. Bayr. Bot. Ges. xi. (1907), 93.

NOTES ON THE FLORA OF CHESHIRE.

By E. & H. Drabble.

The plants named in the following list were observed by us during the years 1905–8 in the Wirral District of Cheshire. Plants which do not appear in Lord de Tabley's *Flora of Cheshire*, in Green's *Flora of the Liverpool District*, in Watson's *Topographical Botany*, nor in Mr. Arthur Bennett's *Supplement* to the same, are marked with a dagger (†), and appear to be new records for the county. Those not hitherto recorded for the Wirral District (District 4 of the *Flora*) are marked with an asterisk (*). In this district, as is well known, many aliens find a home. Of these only such are recorded in this list as appear to be established. It seems desirable to record these on account of the extensive building operations now being carried on, particularly in the Wallasey neighbourhood.

The geological and physical structure of the district is admirably described in Lord de Tabley's volume, and to this we need not add anything here.

Ranunculus circinatus Sibth. Wallasey. — *R. trichophyllus* Chaix. Bidston.—*R. Drouetii* F. Schultz. Poulton.—*R. Baudotii* Godr. Bidston.—†*R. confusus* Godr. Caldy, and, together with its form *salsuginosus* (Hiern), Bidston. (We have in our herbarium a plant collected by J. W. Burton, May, 1876, and named by him *R. confusus* Godr.; the locality given is "Old Chester Road, Cheshire.")—*R. peltatus* Schrank. Leasowe, Poulton.—*R. Flammula* L. var. *radicans* Nolte. Wallasey. — *Caltha palustris* L. b. *Guerangerii* (Boreau). Of this plant Green's *Flora of Liverpool District* states "has been found with us." No localities are given, however. We have frequently met with a plant with narrow non-contiguous sepals at Bidston, but we think this should not be called *Guerangerii* (Bor.), as it appears to be a mere state; and the same may be said of a small plant which grows with the above-named plant, and which in certain respects approaches var. *minor* DC. We have found true *Guerangerii*, however, at Thurstaston.

Castalia alba Wood. Moreton.

Glaucium flavum Crantz. Burton Point.

Radicula palustris Moench. Meols. — *Arabis hirsuta* Scop. Leasowe sandhills. — **Cardamine amara* L. Meols. — *Erophila verna* E. Meyer. Wallasey sandhills.—*E. præcox* DC. Wallasey sandhills.—*Cochlearia Armoracia* L. Thoroughly established on the sandhills at New Brighton and Wallasey.—*C. anglica* L. var. *Hortii* Syme. Bidston, plentiful. There is only one previous record from the Wirral, *viz.*, "Estuary of the Dee at Bromborough," in Lord de Tabley's Flora. (The Bromborough shore, however, is on the Mersey and not on the Dee.) This seems to be the prevalent form of the plant in the district. — *Sisymbrium Thalianum* Gay. Sandhills, common.—*S. officinale* Scop. var. *leiocarpum* DC. Grange.—†*S. pannonicum* Jacq. Quite established

in waste ground at Hoylake (see Journ. Bot. April, 1907).—†*S. polyceratium* L. This plant was found growing luxuriantly at Wallasey, with apparently every prospect of becoming established. Specimens from here were distributed by the Watson Exchange Club in 1908. — *Erysimum orientale* Mill. Sandhills, New Brighton, and waste ground, Upper Brighton, quite established.—*Brassica monensis* Huds. Abundant on the sandhills.—*Diplotaxis tenuifolia* DC. Wallasey.—*D. muralis* DC. Wallasey. —†var. *Babingtonii* Syme. Wallasey. — *Coronopus didymus* Sm. Golf links, New Brighton, abundant. — *C. procumbens* Gilib. (= *Ruellii* All.). Hoylake. — *Lepidium latifolium* L. Enclosed sandhills at Hoylake. As Green's Flora only gives one locality for this plant, and states that at that time (1902) it was threatened by building operations, we are glad to be able to add this new locality where the plant appears to be well established.—*L. ruderale* L. Fairly frequent on roadsides at Wallasey and Birkenhead. —*L. Draba* L. Established on Wallasey sandhills. — *Thlaspi arvense* L. Poulton, Wallasey.

Reseda Luteola L. New Brighton sandhills.

†*Viola obtusifolia* Jord. Bidston, Upper Brighton.—†*V. ruralis* Jord. Wallasey.—†*V. Deseglisei* Jord. Wallasey.

Silene latifolia Britten & Rendle, var. *puberula* (Jord.). New Brighton sandhills. — *S. anglica* L. Golf links, Hoylake. — †*Lychnis alba* × *dioica*. Bidston, growing with the parents. — *Cerastium tetrandrum* Curt. Green's Flora states, "not recorded recently—possibly an error." The plant grows abundantly on the Wallasey sandhills. — *C. semidecandrum* L. A small early flowering form on Wallasey sandhills. — *C. vulgatum* L. (= *triviale* Link) †var. *pentandrum* Lond. Cat. Wallasey sandhills.—†Var. *holosteoides* Fr. Wallasey sandhills. This plant only differs from typical *holosteoides* in having a somewhat hairy calyx, a feature which seems insufficient to warrant a denial of the name to this plant, in view of the fact that in its other features the plant agrees with *holosteoides*. It is so very different from the usual form of *vulgatum* that, if it may not be called *holosteoides*, a new name will be necessary. — *Stellaria apetala* Ucria. Wallasey.—*Arenaria leptoclados* Guss. New Brighton.—*A. peploides* L. New Brighton.—*Sagina nodosa* Fenzl. New Brighton sandhills.

Claytonia perfoliata Donn. Originally recorded from Leasowe, it is now thoroughly established there, and has spread as far as New Brighton. — *Hypericum humifusum* L. †var. *Liottardi* Vill. West Kirby (see Journ. Bot. May, 1907).

Genista anglica L. Thurstaston Heath. — *Cytisus scoparius* Link. Wallasey and New Brighton sandhills. — *Medicago sativa* L. Fully established on the sandhills at New Brighton. It was first seen here by one of us in 1895, and then showed evidence of being long established. It is now extremely abundant, and is spreading rapidly. — *Trifolium arvense* L. †var. *perpusillum* DC. Wallasey and New Brighton. — *T. fragiferum* L. Leasowe, Poulton, Wallasey sandhills. — *T. pratense* L. b. *sativum* Schreb. Apparently established on Wallasey sandhills. — †c. *parviflorum*

Bab. Wallasey. — *T. filiforme* L. Wallasey. — *Ornithopus perpusillus* L. West Kirby.—*Vicia angustifolia* L. White-flowered, West Kirby.—*V. lathyroides* L. Sandhills, Leasowe.

Cratægus monogyna Jacq. *b. *laciniata* Wallr. Wallasey.

Ribes Grossularia L. Long established on the Wallasey sandhills.

Hippuris vulgaris L. Leasowe, Bidston.—*Myriophyllum spicatum* L. Wallasey.—*Callitriche obtusangula* Le Gall. Wallasey. —*C. intermedia* Hoffm. (= *hamulata* Kuetz.). Wallasey.

Epilobium parviflorum Schreb. Meols. — †*E. montanum* × *hirsutum*. Upper Brighton.—*E. palustre* L. Meols.

Conium maculatum L. Newton.—*Apium inundatum* Reichb. f. Wallasey. — *Sium erectum* Huds. Wallasey. — *Pimpinella major* Huds. West Kirby. Green's Flora states that there is "no recent record." — *Anthriscus vulgaris* Bernh. Wallasey, abundant. — *Œnanthe fistulosa* L. Poulton, Bidston.—*Œ. Lachenalii* C. Gmel. Wallasey.—*Œ. crocata* L. Bidston.

Galium palustre L. b. *elongatum* (Presl.). Meols.

Valerianella dentata Poll. Wallasey.

Dipsacus sylvestris Huds. Wallasey. — *Aster Tripolium* L. West Kirby.—*Erigeron acre* L. Sandhills, Wallasey.

Matricaria inodora L. b. *salina* Bab. Burton Point, West Kirby. A plant from West Kirby was transplanted into our garden; the new growth of *the same plant* was that of typical *inodora*, all the features of *salina* disappearing in the same individual. Hence *salina* would appear to be a mere state due to the situation acting on the *individual* and not greatly affecting the race. — *M. Chamomilla* L. Poulton, Upper Brighton, Wallasey. At Poulton occurred some remarkably dwarf plants, some of which were less than two inches in height, with capitula reduced to five or six disc florets, surrounded by very few rays. It is difficult to account for these, as large and fairly typical individuals of this species were growing with them. — *M. suaveolens* Buchenau (=*discoidea* DC.). Wallasey, Bidston, Poulton; thoroughly established in the district. A form with rayed capitula was found at Bidston.—*Cotula coronopifolia* L. Abundant and spreading at Leasowe until 1908, when it seemed to have been interfered with and checked. It is spreading a little into the surrounding districts, and has been found by us inland near Moreton. — *Senecio vulgaris* L. b. *radiatus* Koch. Common on the sandhills.—*Carlina vulgaris* L. Wallasey sandhills. — *Carduus pycnocephalus* L. b. *tenuiflorus* (Curt.). Wallasey, West Kirby.—*Cichorium Intybus* L. This plant occurs fairly frequently, and is perhaps becoming established. — *Picris echioides* L. Newton. — *Crepis capillaris* Wallr. (= *virens* L.) †b. *agrestis* Waldst. et Kit. New Brighton, Thurstaston, West Kirby. — *Hieracium umbellatum* L. Wallasey sandhills, abundant.—*Taraxacum erythrospermum* Andrz. Abundant on the sandhills. — †b. *lævigatum* (DC.) Wallasey. — *T. palustre* DC. Bidston.—*Tragopogon pratense* L. Bidston.

Anagallis fœmina Mill. (= *cærulea* Schreb.). Waste ground, Upper Brighton.

Blackstonia perfoliata Huds. West Kirby.

Cynoglossum officinale L. Wallasey sandhills. — *Symphytum officinale* L. *b. *patens* (Sibth.). Caldy. — *Myosotis scorpioides* L. †b. *strigulosa* (Reichb.). Thurstaston. — *M. collina* Hoffm. Wallasey sandhills. — *M. versicolor* Sm. Wallasey — *Lithospermum arvense* L. Wallasey, Upper Brighton.—*Echium vulgare* L. Wallasey sandhills. — *Amsinckia lycopsoides* Lehm. Wallasey. This plant seems to be becoming established.

Solanum nigrum L. Upper Brighton and Wallasey. A very common weed of cultivated and disturbed land.

Lycium chinense Mill. Poulton, &c. Spreading rapidly.

†*Euphrasia nemorosa* H. Mart. Wallasey.—*Veronica Anagallis-aquatica* L. †b. *anagalliformis* (Bor.). Leasowe.

Stachys arvensis L. Wallasey. — *Lamium amplexicaule* L. Upper Brighton. A very interesting series with cleistogamous flowers was observed.—*L. hybridum* Vill. Wallasey.—*L. purpureum* L. †b. *decipiens* Sonder. Wallasey; queried in Green's Flora.

Scleranthus annuus L. Thurstaston.

Chenopodium album L. Wallasey sandhills. —b. *viride* (L.). Wallasey sandhills. — c. *paganum* (Reichb.). Upper Brighton.—*C. murale* L. Upper Brighton.—*C. rubrum* L. Meols.—*Atriplex patula* L. b. *erecta* (Huds.). Upper Brighton, Wallasey sandhills. —*A. laciniata* L. West Kirby. According to Green's Flora not recorded for Cheshire since 1865.—*Salsola Kali* L. Leasowe.

Rumex Hydrolapathum Huds. Wallasey.—*R. crispus* L. var. *trigranulatus* Sy. Common in the district. Wallasey, &c.

Humulus Lupulus L. Established in a hedge near Poulton.

Orchis morio L. Leasowe.

Iris Pseudacorus L. †b. *acoriformis* (Bor.). Leasowe.

Asparagus officinalis L. var. *altilis* L. Established for many years on the sandhills at Wallasey. Recorded in Green's Flora for 1893, and still there in 1908.

Juncus bufonius L. b. *fasciculatus* (Bert.). Leasowe, Bidston.

Arum maculatum L. Leasowe.—*Lemna gibba* L. Leasowe.

Triglochin maritimum L. Leasowe. — *Zannichellia palustris* L. †b. *macrostemon* (Gay). Wallasey.

Carex paniculata L. Wallasey.—*C. binervis* Sm. Thurstaston Heath.—*C. hirta* L. Wallasey.

Agrostis nigra With. Upper Brighton, Wallasey. —*Trisetum flavescens* Beauv. Wallasey and on the sandhills. — *Avena fatua* L. Wallasey and Upper Brighton. — *Festuca rigida* Kunth. Wallasey. — *F. membranacea* Druce (= *uniglumis* Soland.). The sandhills. — *F. Myuros* L. Poulton, Leasowe, the sandhills.— *F. bromoides* L. (= *sciuroides* Roth). Wallasey, West Kirby.— *F. elatior* L. Wallasey, Meols.—*Bromus secalinus* L. Wallasey. —*B. commutatus* Schrad. Wallasey. — *B. unioloides* H. B. K. This American grass is apparently becoming established at Wallasey. — *Lolium multiflorum* Lam. (Is this really identical with *italicum* Braun?).—*Hordeum nodosum* L. (= *pratense* Huds.). Meols, West Kirby. — *Elymus arenarius* L. New Brighton sandhills.

We have noticed the following aliens, which have only been found sparingly, and cannot be said as yet to be established. They are mentioned in the hope that their status may be further investigated by some local naturalist.

Barbarea verna Aschers. (=*præcox* Br.). Waste ground, Upper Brighton. — *Hesperis matronalis* L. Waste ground, Wallasey. — *Lepidium sativum* (L.). Bidston. — †*L. perfoliatum* L. Wallasey.

Saponaria Vaccaria L. Waste ground, New Brighton.

†*Lavatera arborea* L. A large plant was found in a flourishing condition about two miles from West Kirby. It is no doubt an escape from cultivation.

Trifolium resupinatum L. Waste ground, Wallasey.

Lathyrus Aphaca L. Wallasey, Birkenhead Docks.

Caucalis latifolia L. Waste ground, Upper Brighton.—†*C. daucoides* L. Waste ground, Wallasey.

Centaurea Cyanus L. Birkenhead, Wallasey.

†*Crepis mollis* Aschers. (=*succisifolia* Tausch). West Kirby. This plant was growing in a field with *C. capillaris* Wallr. (=*virens* L.); it is difficult to understand whence this plant can have come.—*Hieracium aurantiacum* L. Birkenhead Docks.

Echinospermum Lappula Lehm. Wallasey. This plant has occurred in several places, and may become established.

Verbascum nigrum L. Field at Upper Brighton.

Panicum Crus-galli L. Waste ground, Wallasey.

Setaria viridis Beauv. Waste ground, Upper Brighton.

We have pleasure in recording our thanks to the Manager of the Wirral Railway Company for his kindness in permitting us to explore the land belonging to the company. This permission was particularly valuable, owing to the fact that it gave us access to a small portion of the sandhills which retains in quantity many plants which are disappearing elsewhere.

SOME MADEIRA *HEPATICÆ*.

By Eleonora Armitage.

To complete the study of my collections of Madeira Bryophyta, I here present a list of the *Hepaticæ* gathered in the island from January to March, 1909. Mr. H. N. Dixon has already described the Mosses in the number of this Journal for October, 1909. There are some thirty-seven species and varieties in upwards of sixty gatherings. Out of this number twenty-three have already been recorded for the island, either by Mitten in Godman's *Flora of the Azores*, 1870; by Prof. Dr. V. Schiffner in *Oest. Bot. Zeitschr.* 1901, and in *Hedwigia*, 1902; or by M. A. Luisier in *Broteria*, vol. viii. 1910. Of the remaining fourteen, I have not been able to find any mention in the works consulted at the British Museum, and therefore conclude they have not before been pub-

lished as belonging to the Madeira Flora; these are indicated by an asterisk preceding the name.

Thirty-nine other *Hepaticæ* have been recorded, which I did not meet with; thus the total for Madeira as at present known is brought up to seventy-six.

My grateful thanks are due to Mr. S. M. Macvicar for naming the *Hepaticæ* for me, and to M. A. de Crozals for his notes on the *Ricciæ*.

**Riccia glauca* L. and *forma *ciliata*; the latter with a few ciliæ on the margin of the frond. On a wall-top, Caminho do Palheiro, 1600 ft.

R. glauca L. *var. *commutata*. On shady ground, Monte, 1500 ft. By some hepaticologists this plant is given specific rank, but M. de Crozals thinks it is better placed as a variety or form under *R. glauca*.

Corsinia marchantioides Raddi. On a low wall, Ribeira de João Gomes, 1500 ft.; on the ground, Monte, 2000 ft.; Curral dos Romeiros, 1600 ft.; with inflorescence, in a cave, Curral das Freitas, 3000 ft.; with fruit on a wall, Caminho do Palheiro, 1500 ft.

Targionia hypophylla L. *C. fr.* on basaltic rocks, plentiful, Curral dos Romeiros, 1500–1800 ft.

Plagiochasma rupestre (Forster) Steph. *C. fr.* on walls in Funchal, 50 ft.; on rocks near Camara de Lobos, 20 ft.; on rocks near São Roque in Ribeira Santa Luzia, 1000 ft.

**Reboulia hemisphærica* (L.) Raddi. Near Monte, 1800 ft.; damp rocks, Monte, 1500 ft.

Conocephalum conicum (L.) Dum. Hanging in long trails over a wet vertical rock, Monte, 1500 ft.

Lunularia cruciata (L.) Dum. *C. fr.* in a cave, Curral das Freitas, 3000 ft.; on earth near Camacha, 2300 ft.; damp wall in Funchal, 50 ft.; ditch-bank at Monte, 1800 ft.; on earth, Monte, 1600 ft.

Marchantia polymorpha L. With male inflorescence on damp rock, Monte, 1500 ft.

**Aneura sinuata* (Dicks.) Limpr. *C. fr.* on shady ground, Monte, 1900 ft.

Fossombronia angulosa (Dicks.) Raddi. *C. fr.* on rocks, Ribeira de João Gomes, 1500 ft.; *c. fr.* on earth in shade, Monte, 2000 ft.; on earth near Monte, 1500 ft.; by roadside among mosses, Caminho do Conde de Carvalhal, near Funchal, 500 ft.

F. pusilla* (L.) Dum. *C. fr.* Funchal, 50 ft.; *c. fr.* on bare earth, Pico d'Arruda, 800 ft., near São Martinho; on a wall, Caminho do Palheiro, 1500 ft.—F. pusilla* var. (?). *C. fr.* on a sandy bank among herbage, Ribeira de Santa Luzia, 3000 ft. "Spores reticulate on the face, lamellate on the margin, *S. M. M.*"

**F. cæspitiformis* De Not. *C. fr.* on bare earth in shade, Monte, 1800 ft.; much less frequent than the other two species.

Marsupella emarginata (Ehr.) Dum., var. On the ground, under pine-trees, 2800 ft.; above Alegria, near São Roque; a small dark chocolate-brown plant.

Nardia hyalina (Lyell) Carr. *C. fr.* Monte, 1800 ft.

Aplozia crenulata (Sm.) Dum. *C. per.* near the Poizo Pass, 4500 ft.; on Pico d'Arrebentão, near Monte, 2500 ft.

Plagiochila spinulosa (Hook.) Dum. Shady bank near Pico das Rosas, 2000 ft.

Gongylanthes ericetorum (Raddi) Nees = *Calypogeia ericetorum* Raddi. On earthy banks in shade, Ribeira de Santa Luzia, near São Roque, 2000 ft.; Monte, 1500–1800 ft.; roadside near Camacha, 2300 ft.; widely distributed.

**Lophocolea heterophylla* (Schrad.) Dum., var. Monte, 1600 ft. —*L. bidentata* (L.) Dum. probably. Monte, 1700 ft.

Saccogyna viticulosa (Dicks.) Dum. Monte, 1600 ft.

Calypogeia fissa (L.) Raddi = *Kantia calypogeia* (Raddi) Lindb. = *Kantia Sprengelii* (Mart.) Pears. In shade under trees, Monte, 1500–1700 ft.

**Cephalozia bicuspidata* (L.) Dum. Pico d'Arrebentão, 2500 ft.

Diplophyllum albicans (L.) Dum. *C. fr.* Pico d'Arrebentão, 2500 ft.; near the Poizo Pass, 4000 ft.

Scapania compacta (Roth) Dum. Monte, 1800 ft.

Madotheca canariensis N. ab E. Near Pico das Rosas, 2000 ft. —**M. lævigata* (Schrad.) Dum. var. *Thuja* Nees. Bocca dos Namorados, near Jardim da Serra, 3000 ft.; shady bank near Pico das Rosas, 2000 ft.—*M. Thuja* (Dicks.) Dum. Poizo Pass, 4500 ft.

Radula Lindbergiana Gottsche (probably). Trees, Monte, 1800 ft.; rocks, Ribeira de João Gomes, 1700 ft.

**R. Bornmülleri* Schiffn. (probably). Rocks, Caminho do Palheiro, 1500 ft,; near Funchal.

Frullania dilatata* (L.) Dum. On rocks, Ribeira de João Gomes, 1700 ft.—F. dilatata* var. On a stone wall, Caminho do Meio, Funchal, 800 ft.; a small compact plant.

F. polysticta Lindenb. On rocks, Ribeira de João Gomes, 1800 ft.—*F. Teneriffæ* N. ab E. Epiphyte on *Vaccinium Maderense*, Poizo Pass, 4550 ft.

Anthoceros dichotomus Raddi. *C. fr.*, abundant on damp rocks, Monte, 1500–1800 ft.; Ribeira de João Gomes, 1500 ft.; on earthy bank near Camacha, 2300 ft.

THE GENUS *EUCLEA* IN AUSTRALIA.

By W. P. Hiern, M.A., F.R.S.

Preserved among some collections of Australian plants now being incorporated at the British Museum, a specimen submitted to me proves to be an undescribed *Euclea*. The occurrence of this African genus in Australia is obviously a fact of much interest from the phytogeographical point of view. As at present known, *Euclea* comprises about three dozen species, all African—and mostly South African—except the subject of this notice, and perhaps *E. suberifolia* Parment. (*Diospyros suberifolia* Decaisne),

supposed to have been brought from Chili. The extension in its range now announced brings *Euclea* into line with such genera as *Hibbertia*, *Keraudrenia*, *Helipterum*, *Athrixia*, and a few others of which the distributional area is Australia and Africa, or at least Madagascar.

The collector of *E. australiensis*, Major (afterwards Sir Thomas L.) Mitchell, published in 1838 *Three Expeditions into Eastern Australia*, the work forming his chief claim to remembrance. A set of the plants was presented to the British Museum, and there is also an excellent one in the Kew Herbarium. Unfortunately no indication of locality accompanies the specimen here dealt with; as I am advised, however, that in no case has there been ground for suspecting any of the specimens in Mitchell's bundles to have got there by mistake, there is no reasonable doubt, although *E. australiensis* is not represented at Kew, that its habitat is Australia, but whether Queensland or New South Wales, in Mitchell's time not yet separated, cannot be decided. But inasmuch as the bulk of the specimens come from Queensland, that is probably the locality.

Euclea australiensis, sp. n. E. diœca fruticosa ramulosa ut videtur sempervirens, ramulis gracilibus teretiusculis obscure striatis lineatisque minute pulverulento-glandulosis pilis brevibus pallidis hispidulis foliosis, foliis oppositis vel subopppositis anguste oblongo-ovalibus apice obtusissimis vel rotundatis basi obtusis vel breviter cuneatis coriaceis utrinque minute pulverulento-glandulosis sparse vel obsolete hispidulis integris margine anguste revolutis leviter vel vix undulatis super griseo-viridibus infra leviter rufo-viridibus 30–37 mm. longis 6–10 mm. latis utrinque moderate reticulosis, petiolis hispidulis 1·5–2 mm. longis; floribus masculis racemosis tetrameris vel pentameris, racemis axillaribus 3–6-sæpius 5-floris leviter hispidulis minute glandulosis 12–14 mm. longis laxis, pedicellis patulis sæpe oppositis basi bracteolatis 2–3 mm. longis terminali recto sæpius breviore, bracteolis parvis lanceolatis vel subulatis deciduis vel marcescentibus, calyce hemisphærico pergameno minute puberulento-glanduloso 2 mm. diam. lobis brevibus vel brevissimis apiculatis, corolla hemispheroidi firme carnosa extra minute glandulosa leviter pallide pubescente 4 mm. diam. 3 mm. longa lobis rotundatis 1·5 mm. longis in æstivatione sinistrorse (ut deorsum visis) contortis, staminibus 21 vel 22 erectis vel ascendentibus basi corollæ vel toro insertis 1·7–2·4 mm. longis, filamentis 0·4–0·8 mm. longis glabris gracilibus, antheris lanceolato-subulatis partim pallide pubescentibus 1·3–1·6 mm. longis lateraliter dehiscentibus, ovario rudimentario basi pallide hispido apice stylo glabriusculo fisso desinente.

Habitat in Australia.

Affinis *E. lanceolatæ* E. Mey., staminibus numerosioribus differt, et c.

Collected by Major T. L. Mitchell (afterwards Sir Thomas Mitchell), probably in Queensland, 1831–1838.

GEORGE STABLER
(1839–1910).

George Stabler, who did much to advance the knowledge of British *Hepaticæ*, died at Levens, Milnthorpe, Westmoreland, on the 4th of January. He was born at Craike, on the borders of Durham and Yorkshire, on the 3rd of September, 1839, and was a schoolfellow of Richard Spruce at Ganthorp, near Malton, Yorkshire. From Spruce he acquired his love for *Hepaticæ*, and Mr. Wallace in editing the *Notes of a Botanist on the Amazon* acknowledged much help from Stabler for particulars of Spruce's early life. He removed to Levens, Westmoreland, when quite young, where he was village schoolmaster for many years, until the loss of his sight forced him to retire, and prevented him from

continuing his bryological work. He and two friends and neighbours, J. M. Barnes and J. A. Martindale, schoolmaster of Stavely, took up the study of mosses, ferns, and lichens respectively. On Saturdays they collected and met to compare notes. In this way they explored much of the beautiful Lake District, so that its cryptogamic Flora has been better worked than other parts of the country. Stabler's blindness was a great affliction, cutting him off from his favourite study. The writer remembers how he used to talk about Dr. Gough, the blind botanist of Kendal, who could distinguish plants by the feel and touch of his tongue on the stamens and pistil, or by drawing them across his lips; but such processes were too coarse for use with *Hepaticæ*.

Stabler's work was chiefly that of a field naturalist. He corresponded with Lindberg, Spruce, Pearson, &c., and gave

valuable assistance to others. The district in which he worked is a rich one—the mountains and valleys of the Lake District, and the "mosses" of the Kent Estuary, which are the haunt of many rare *Hepaticæ*. He published a valuable series of papers on the *Hepaticæ* and *Musci* of Westmoreland in *The Naturalist* in 1888–1898, and added some rare species to the British Flora: e.g. *Jungermannia Helleriana* Nees, found on rotting trunks in Naddle Forest, Mardale, and later in Scotland; *Plagiochila Stableri* Pearson (described and figured in this Journal for 1896, pp. 241, t. 358); *Marsupella Stableri* Spruce, found on Bow Fell in 1875, and an Anthoceros (*A. Stableri* Steph.), on sandy fields at Foulshaw, which is not known from any other locality. Lindberg named after him the genus *Stableria* (*Orthodontium*).

An interesting account of Stabler appears in the *Kendal Times* for January 14 from the pen of Mr. J. A. Barnes, who was six years at his school, from which a passage may be quoted: "Once, when his sight was so far gone that he could only see large print with a powerful lens, I had been reading to him from a French journal a description of a liverwort which he had gathered years before on Levens Moss, and he set his heart on my finding a specimen. The whole plant was no larger than a pin's head, and the quest seemed as hopeless as that of the proverbial needle in a haystack. But we walked out together until we reached a field in which a luxuriant crop of seed-grass was springing. 'Now,' said he, 'find a bare patch.' With some difficulty I discovered a patch where the growth was less rank, and began to examine the soil inch by inch under his direction. After several mistakes I found at last a few green scales, and with the aid of his lens he was able to identify these as the plant we were in search of."

To the above may be added some account of James Martindale Barnes (1814–1890), abridged from an article contributed by Stabler to the *Kendal Times* of May 16, 1890. Barnes was the eldest son of a Westmorland farmer, and was born at Kitcrag, Selside, Feb. 10, 1814. At the age of twenty he left the farm and went to Liverpool, and thence to London, where he became an officer in the Customs. In 1847 he returned to Westmorland, and settled at Levens, where the rest of his life was spent. About 1859 he began the study and collection of British ferns, and soon brought himself into the front rank of British pteridologists. Linton's *Ferns of the Lake Country* was edited by him, and gives evidence that he had ransacked almost every corner of the county. He numbered amongst his friends and correspondents Thomas Moore, G. B. Wollaston, E. J. Lowe, P. Neill Fraser, Colonel Jones, the Stansfields, and many others.

In 1867 Barnes began the study of British mosses, into which he threw himself with all the energy of youth. His discovery of *Leucobryum glaucum* in fruit brought him into communication with the late John Nowell and Dr. Wood of Manchester, the latter o

whom rendered him valuable assistance. Henry Boswell, M.A., G. E. Hunt, and W. Curnow were among his correspondents, as were also W. H. Pearson, William Wilson, and Dr. Braithwaite, to whose *Sphagnaceæ Britannicæ exsiccatæ* Barnes was the largest contributor of specimens. He found one species new to science, which Prof. Schimper of Strasbourg named *Bryum Barnesii*; and was the first to find *Sphagnum Austinii* in England. His collection of mosses has been placed in the Kendal Museum.

Perhaps it is not too much to say that Westmorland has had no more ardent enthusiast as a botanist since the days of Thomas Lawson. This sketch should not be closed without noticing the great willingness, kindness, and pleasure he always had in initiating others into his favourite pursuits, and his success in kindling their enthusiasm. He died May 9, 1890, and was buried in the churchyard at Heversham.

An article on his collection of ferns by Mr. Charles T. Druery appeared in the *Gardeners' Magazine* for Sept. 11, 1897.

C. H. Waddell.

SHORT NOTES.

Lepidium heterophyllum L.—In our notes on Bristol Plants published in the January number of the Journal (p. 7), we included what at the time we believed to be the var. *longistylum* More of *Lepidium campestre*, as described in Man. Brit. Bot. ed. 9: the habit of our plant pointing that way, and its pouches being covered with such an amount of scaly material as seemed to remove it from *L. heterophyllum*. On reading the note referred to, Dr. Thellung of Zurich, author of the *Monographie der Gattung Lepidium* (N. Denkschr. d. Allg. schweiz. Gesellsch. f. Naturw., 1906), wrote for information, stating that he had no knowledge of More's variety, and much doubted the existence of such a form of *campestre*. He suspected that plants so named might actually belong to *L. heterophyllum*. A specimen of our West Gloucester gathering was forwarded and Dr. Thellung reported it to be the latter species, coming rather under the var. *leiocarpum* Thell. (Monogr. 1906, p. 99) "silicula lævis vel minutissime papillosa," than under var. *papillosum* (Dunn) Thell. *l.c.* p. 100 "silicula papillis squamiformibus concavis distinctius asperulæ." It may be remarked that in the dried state the silicular surface would naturally appear much smoother than when fresh; but doubtless that difference had been allowed for. Dr. Thellung's remark that he could neither hear of an authentic specimen of More's *longistylum*, nor learn where that variety was published, prompted some enquiries which so far have led to no positive result; none of the British botanists appealed to can give any information on the point. Dr. Moss tells me there is no specimen or memorandum to be found in Babington's British collection at Cambridge; nor could the Messrs. Groves meet with either at the British

Museum; we understand that the latter included it in ed. 9 of the *Manual* on the faith of an annotation by Babington. The subject is of some general interest; and if any botanist can throw light upon it, Dr. Thellung in particular will be extremely glad to hear from him at Dufourstrasse 73, Zurich.—Cedric Bucknall and James W. White.

Carex divulsa × vulpina (pp. 100, 140).—The Newland plant was observed and gathered in 1884 and 1885 and I think disappeared a year or so later. My object in this note is to state that the remarkably different spikes were certainly gathered from the same root, the smaller and simpler spikes with shorter stems outnumbering considerably the larger and more compound spikes with longer stems. This difference was quite noticeable upon the living plant, and in my own specimens and in some, at least, of those I have distributed, I have endeavoured to show examples of each. I have seen a somewhat similar variation upon a root of *C. vulpina* × *remota* (*axillaris* Good.), and think it is not very unusual with hybrids. If the larger spikes, which are said to represent *C. vulpina* var. *nemorosa*, really agree with that plant (upon which I am unable to give an opinion, having seen no specimen), I would ask, might not that be a vigorous example of the same hybrid, exhibiting more clearly than do the smaller spikes the *vulpina* side of its parentage? Neither the late Mr. William Mathews, who saw the plant growing, nor myself, had any doubt of its hybrid origin, and under date July 4, 1885, Mr. Arthur Bennett wrote: "It really does seem to be a hybrid. I am very chary of accepting such, but here there seems no help. The top of the spike is very like *vulpina*, and I am inclined to agree with you in calling it *vulpina* × *divulsa*."—Richard F. Towndrow.

Some New County Records of Sphagna. - Mr. J. A. Wheldon and Mr. W. Ingham have kindly supplied me with names and census data for the accompanying list:—

Elgin (95), on Ben More, September, 1909: *Sphagnum acutifolium* R. & W. var. *versicolor* W., *S. submitens* R. & W. var. *violascens* W., *S. teres*, Angstr., *S. compactum* DC. var. *subsquarrosum* W. and var. *imbricatum* W.

Easterness (96), September, 1909: Curr Moss, *S. subnitens* R. & W. var. *obscurum* W., *S. inundatum* W.; by Loch Mor, *S. teres* Angstr. var. *imbricatum* W.

Berks (22), June, 1907, Greenham Common: *S. rubellum* Wils. var. *rubrum* Grav. f. *robusta* Warnst.

Radnor (43), Rhos Goch, July, 1906: *S. subnitens* R. & W. var. *versicolor* W., *S. recurvum* (P. B.) W. var. *mucronatum* (Russ.) W.

Westmorland (69), May, 1907, Fairfield, 2500 ft.: *S. compactum* DC. var. *imbricatum* W.; Rydal Head, *S. rubellum* Wils. var. *purpurascens* W.; Easedal, *S. subnitens* R. & W. var. *obscurum* W.—Eleonora Armitage.

Viola Foudrasi Jord. in Somerset.—In 1908 I gathered this violet near Clevedon, N. Somerset, on limestone; and also a

plant with small, scentless, white flowers. The latter has been ascertained by Mrs. Gregory to be a form of *V. Foudrasi* Jord. not previously reported. It has been grown on by Mr. Hunnybun, and cultivation has not altered its characteristics, which render it very different in appearance from *V. hirta* f. *lactiflora*, and from the sweet white violets. As it has this spring been found by Miss Peck in Devon on sandstone, it is possible that search may reveal it elsewhere.—MARY A. G. LIVETT.

SALSOLA KALI L. var. TENUIFOLIA Moq.-Tand.—In this Journal for 1904 (p. 26) I recorded the above plant, which, in the company of Mr. T. Hilton, I found on the foreshore near Southwick growing with *Caucalis daucoides* and *Atriplex rosea*. On comparing the *Salsola* I found it was identical with the var. *tenuifolia* in Wirtgen's *Flora Rhenana*, fasc. vi. 252, and it agreed with the description in the *Prodromus*, xiii. par. 2, p. 188, 1849. Subsequently, however, Mr. C. E. Salmon (Journ. Bot. p. 277, 1907) identified a specimen sent him by Mr. T. Hilton, which he concluded was the same as my plant as *S. Kali* L. var. *Tragus* L. Recently Mr. T. Hilton has shown me this plant, which is probably a native of the Sussex coast, and I find it quite different from the one I gathered, which came from a rubbish heap, and was, I think, an alien. As I said, it is a tall, slender plant, without prickles, quite unlike *S. Tragus*. Mr. Hilton thinks the locality for my plant should be Shoreham, not the adjoining Southwick.—G. C. DRUCE.

BARBAREA STRICTA Fries.—The name *stricta* was first given to this plant (teste J. G. Baker in *Phytologist*, N.S. i. p. 327, 1855–6), by Fries (*Summa Vegetabilium*, i. p. 146) in 1819. Nine years later in the *editio altera* of the *Novitiæ Floræ Sueciæ* Fries proposed to change the name to *parviflora* in order to lessen the risk of its being confounded with the form of *lyrata* (*vulgaris*) with rigid, adpressed pods, but in the meantime Andrejovski had adopted the name *stricta*; Fries has been wrongly displaced as the original name of the species. It was first recorded as British by W. Borrer "between Sheffield and Halifax, and between Weedon and Blisworth plentifully" (see *Bab. Manual*, p. 20, 1843). This Northamptonshire locality should be deleted, as I have elsewhere pointed out (*Journ. Northamp. Nat. Hist.*, p. 94, 1880). In the *Phytologist*, N.S. vi. p. 46, 1864, Borrer says:—"Perhaps I too hastily set down this plant as growing in Northamptonshire, having only seen what I took for it in passing on the railway in 1842, and not having been able to see it on several subsequent occasions." I have made more than one visit to the place, but have only been able to see *B. lyrata*. One specimen of the true plant was found by me as a casual at Hackleton in the same county in 1878.—G. CLARIDGE DRUCE.

LATHRÆA SQUAMARIA L.—At Harefield, Middlesex, on April 23rd, the Rev. J. Roffey found straw-coloured plants of this species, growing with the normal purplish plant—here parasitic

on elm. Though a white form is met with, and a dead-white form is also mentioned in German floras, as f. *nivea*, I cannot find any record of such a straw-coloured form in floras as occurs at Harefield. Mr. Roffey also noticed the plant there last spring. There is no other character in which the plant differs.—F. N. Williams.

REVIEWS.

Agricultural Botany, Theoretical and Practical. By John Percival, M.A., F.L.S., Professor of Agricultural Botany, University College, Reading. Fourth edition. 8vo, pp. xiv, 828, with 265 figs. in text. London: Duckworth. 1910. Price 7s. 6d. net.

The complaint has been sometimes made that so-called handbooks on Agricultural Botany are mere elementary text-books of botany with no special adaptations to the wants of students of agriculture. Such a charge cannot be brought against Professor Percival's book, and the success with which it has met is proof that it has supplied a real want. The book is well known to students and teachers of agriculture, and as the original edition of 1900 was reviewed in this Journal for that year (p. 359), it is only necessary to point out how the present edition differs. There is a slight increase in size, 828 pages as compared with 798; the number of illustrations is the same. It may be remembered that a notable feature is the fact that the drawings are all original, and with the exception of the diagrammatic figures have been made by the author from living or natural examples. The most important additions to the text are, in the first place, a section in the chapter dealing with Reproduction on Mendelian laws of inheritance. The recognition of Mendel's work and its bearing on the laws of inheritance has come about since the date of the first edition, and the ten pages which Professor Percival now devotes to the subject form a brief introduction to a subject which is of the first importance to the scientific student of agriculture. A short addition has also been made to the last chapter in the book, that on the work of Bacteria. During the last few years a number of plant-diseases have been attributed to the agency of bacteria, but in only a few cases has satisfactory proof been forthcoming that bacteria alone are the direct cause of the disease. The trouble is often primarily due to other causes, such as insect attack, attacks of parasitic fungi, action of frost, &c. The bacteria enter by means of the wounds thus formed, and carry on their various processes of putrefaction and decay in the dead organic material formed. In some cases, however, the disease is set up directly by bacteria which enter the tissues through the normal channels. A description is given of such a case in the "Black Rot" of cabbages caused by a bacterium, *Pseudomonas campestris*.

A. B. R.

Lincolnshire Plants.

The Lincolnshire Naturalists' Union has issued *A Check-List of Lincolnshire Plants*, by the Rev. E. A. Woodruffe-Peacock, which is described by the author as "a sign-post on the way to a flora." As it stands, it is "an analysis of some 500,000 observations" and thus evidently contains as much condensed information as would serve for the basis of a longer work. For some reason—at least so we assume, though we cannot divine what it may be—the List is arranged in alphabetical order, which renders it inconvenient for comparative purposes, allied plants being thus dissociated. It is, however, a masterpiece of compression, the phanerogamic flora of a large county being compressed into sixty-four pages. Each species takes a line, in which are indicated the date and authority for first observation, and the distribution in the county. The nomenclature is that of the tenth edition of the *London Catalogue*, well-known synonyms being also given; occasionally the cross-reference fails — e.g. "*Limnanthemum peltatum* = *Nymphoides peltatum*," but *Nymphoides* does not appear. No distinction is made between natives and aliens, but erroneous records are placed in square brackets. It is to be regretted that "the map and parish list with division numbers, issued by the Union in 1895," should not have been reprinted with the List, to which it is an almost essential accompaniment: the map we are told "is still on sale, and can be obtained from Mr. A. Smith, the County Museum, Lincoln," but no indication is given of price, nor is that indicated for the List itself, which is issued by Messrs. Goulding, printers, 20 Mercer Row, Louth. The printing, by the way, leaves something to be desired: the word synonymy (like the thing itself) seems to present special difficulty—on p. 4 it stands as "synonomy" and "synonmy."

We hope that the Flora, which has for some time been anxiously looked for, will not be long delayed; meanwhile will not Mr. Woodruffe-Peacock send us for publication notes on certain named but undescribed forms—e.g. "*Veronica agrestis* v. *bottesfordiensis*" and "*V. Beccabunga* v. *argillaceasicca*"—which, we think, here make their first appearance? On the former, indeed, we have a note which is not quite easy to understand, but which suggests that its claim to varietal rank is but slight; it would be interesting to learn more about it and about its portentously named congener of which the List tells us nothing. The note on the former runs: "The form of *Veronica agrestis* L., which for the sake of distinction I have recorded as 'v. *bottesfordiensis* mihi,' and have known in garden soils since 1874, which the Revd. W. W. Mason, of Bootle, knows in this county almost as well as I do, seems to be nothing more than a state in the evolution of the '*flore albo* form of the type,' with what Mr. F. A. Lees rightly styles 'a different facies.' At least I have at last come across forms in tilth this season (1910), which show every fluctuation from the type to my characteristic variety on to the pure *flora* [*sic*] *albo* of both."

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on April 7th Mr. Augustine Henry gave an exposition of his paper entitled "Elm-seedlings showing Mendelian results," illustrating his remarks with lantern-slides. He pointed out that there are but two species of elm in Britain, *Ulmus montana* With. and *U. glabra* Mill.; both are known in the East of England as "Wych-elm." There are in addition many so-called varieties, the most remarkable being the "English Elm" of British botanists and foresters, confined to the South of England, and styled *U. campestris*; this tree is unknown on the Continent. The "Huntingdon Elm" he regarded as a hybrid, the first cross between the two species cited. The previous year had been noteworthy for the profuse fruiting of every kind of elm in England, due to the fine autumn of 1908 and the abnormal amount of sunshine during the spring of 1909. The author had procured abundance of seeds of numerous varieties and forms, and from many localities. These had been sown, and their progeny analysed. It was shown that the plants thus arising conformed very closely to the Mendelian formula of 9 : 3 : 3 : 1. The author gave, in confirmation of his views, the experience he had with regard to the Black Italian poplar, *Populus nigra* × *deltoidea*, the Cricket-bat willow, *Salix alba* × *fragilis*, and the Luccombe oak, *Quercus Cerris* × *Suber*; namely, that the offspring of a first cross invariably produced a crop of the most diverse character, and this induced the author to formulate his view, that when botanists were unable to agree about the forms of a given plant, it was due to a mixture of at least two species, but where there was practical unanimity, as with varieties of beech and ash, there was only one species concerned, and the varieties were due to individual peculiarities. He finally insisted upon the importance of planting trees of a first cross, on account of their abnormal luxuriance and rapid growth, and their producing timber far more quickly than either parent.

At the meeting of the Linnean Society on April 21st, 1910, a paper by Miss M. G. Sykes was read entitled "The Anatomy of *Welwitschia mirabilis*, in the Seedling and Adult Stages," of which the following is an abstract:—The development of the ridges bearing inflorescences has been studied. The outer ridges originate as two small projections between the margins of the cotyledon bases; the accelerated growth producing the two projections then spreads laterally, and forms two elongated ridges. Similar meristematic growth, at the base of the cotyledonary buds, produces the inner ridges. In the developing ridge a concentric ring of bundles is differentiated; these and the bundles supplying the inflorescences are composed entirely of secondary elements, and are later prolonged downwards to join the four concentric groups of vascular tissue in the hypocotyl. These four concentric groups form the most characteristic features of the transition, they suggest comparison with the *Medulloseæ*. The

main features of the transition are most like *Araucaria*, the resemblance is probably dependent on habit. There are also points of resemblance to the Cycads; centripetal xylem is developed in connection with the cotyledonary bundles. Several abnormalities are described. On the whole, the investigation has served further to confirm the impression of the aberrant nature of the plant; it may indeed be described as an "adult seedling."

Dr. F. Arnold Lees has written, and the Bradford Public Libraries Committee has published as a threepenny pamphlet, an interesting but somewhat discursive account of his herbarium (containing 25,000 specimens) which, with his library, was acquired in 1905 for the Cartwright Hall Museum of that town. Additions are still made to the collection, "to the End that when the whole has been arranged, mounted and (as far as possible) fully labelled, it shall be and continue to be an Evergreen although a 'Dried-Garden' for the mind: an exemplary because a Truth-witnessing history of its fair subject—in fine, a befitting Monument to Flora (or Ceres) 'when in sorrow and cultivation was neglected,' crowned with that *Laurus nobilis* which grows in such wise as ever seems to make it the wreath of sweetest symbolism and honour." This sentence, reproduced *verbatim et literatim*, will give some idea of the literary style of the pamphlet.

Botany "as she is Taught."—The extraordinary drivel which fills the "children's corners" of our newspapers is never more extraordinary than when it touches on natural history. In this direction the *Daily News* has long held pre-eminence: here is an example from the issue of May 7:—

"My favourite flower is the——. Well, I won't tell you. You tell me, and I will give a book to the boy and another book to the girl who tells me best. You may tell me in a long essay of not more than a hundred words, you may tell me in rhyme like this:—

The best flower of all
In the meadow that grows,
Large, middling, or small,
I am sure is the buttercup;

or in any other way you think best.

"Perhaps your best way would be to give one or two reasons why you like your favourite flower. If you are able, you can tell me what family your flower belongs to, and therefore what its near relatives are. For example, if you chose the milkwort, you might say it belongs to the pink family, and has for its cousins the red and white campion, the cloves, and the carnations. But it really doesn't matter whether you tell me that or no."

It is difficult to know whether to admire more the literary skill which rhymes "grows" with "buttercup" (apparently any other name will do as well) or the botanical knowledge which places the milkwort in "the pink family." But evidently "it really doesn't matter whether" one is accurate or the reverse.

BOOKS OF THE OPEN AIR.

TREES AND SHRUBS OF THE BRITISH ISLES.

By C. S. COOPER, F.R.H.S, and W. PERCIVAL WESTELL, F.L.S. Over 550 Species of Trees and Shrubs are described. 16 Full-Page Coloured Plates and 70 Black and White. 2 Vols., **21s. net,** or in 16 Parts at **1s. net. per Part.** Detailed Prospectus on application.

"These two volumes, in short, constitute an admirable work of reference, and as such ought to find their way at once not merely into all public libraries, but into every country house where horticulture, either as a pursuit or a pastime, is studied."—*Standard.*

SUMMER FLOWERS OF THE HIGH ALPS. By SOMERVILLE HASTINGS, M.S. Fcap 4to, 7*s.* 6*d.* net. *Ready immediately*

This volume is, it is believed, unique, being the first of its kind. 39 Coloured Plates, photographed direct from nature by means of the Lumiere process. This method ensures at once accuracy of detail and correctness of colour rendering.

PROSPECTUSES SENT POST FREE ON APPLICATION.

J. M. DENT & SONS, Ltd., 29–30, BEDFORD ST., LONDON, W.C.

NATURE STUDY.

By W. J. GORDON.

Each volume contains 33 full-page Plates containing a Coloured Illustration of every Species.

PRICE SIX SHILLINGS EACH.

OUR COUNTRY'S FLOWERS.

OUR COUNTRY'S BIRDS.

OUR COUNTRY'S BUTTERFLIES & MOTHS.

OUR COUNTRY'S SHELLS.

OUR COUNTRY'S FISHES.

OUR COUNTRY'S ANIMALS.

(Mammals, Reptiles, and Amphibians.)

BY THE SAME AUTHOR. Crown 8vo. Cloth, **3s. 6d.**

EGGS OF BRITISH BIRDS.

BEING A SUPPLEMENT TO "OUR COUNTRY'S BIRDS."

WITH 16 FULL-PAGE COLOURED PLATES,

398 Figures of Eggs, and a List of British Birds past and present.

LONDON: SIMPKIN, MARSHALL, HAMILTON, KENT & Co. LTD.

HERBARIUM LABELS.—5s. per 1000, or 8d. per 100, post free. Printed ready for filling up. Can also be had with Collector's Name printed in at a slight extra charge, for not less than 500.

WEST, NEWMAN & CO., 54, Hatton Garden, London, E.C.

CAMBRIDGE UNIVERSITY PRESS

Fossil Plants. A Text-Book for Students of Botany and Geology. By A. C. SEWARD, M.A., F.R.S. In Three Volumes, of which Volumes I. and II. are ready, and Volume III. is in the Press.

Vol. I
Demy 8vo
112 illustrations
10*s.* net

"The botanical side of palæontology has been passed over in general treatises and text-books in a manner that shows the authors had little, if any, personal knowledge of fossil plants. This has been due to the want of any trustworthy elementary manual on the subject. Mr. Seward's admirable book . . . will supply this want. . . . A work full of matter and observation. Botanists and geologists must equally congratulate themselves on having so obscure and difficult a subject put before them for the first time in a really lucid and comprehensive manner."—*Nature*

Vol. II
Demy 8vo
266 illustrations
15*s.* net

"Professor Seward's second volume carries on successfully upon its established lines, a text-book which all earnest students of botany and geology will value highly. . . . The exposition is, as in the preceding volume, always lucid, well-ordered, minutely detailed, and well abreast of the results of recent researches in Palæobotany." —*Scotsman*

The Classification of Flowering Plants. By A. B. RENDLE, M.A., D.Sc., F.L.S. Volume I. Gymnosperms and Monocotyledons.

Demy 8vo
187 illustrations
10*s.* 6*d.* net

"Dr. Rendle has produced the first instalment of a text-book which will well represent the state of our knowledge in the early years of the century. In the present volume the Gymnosperms and the Monocotyledons alone are dealt with; but they are treated with such excellent co-ordination of detail and such clear-headed sense of proportion that we eagerly await the publication of the next instalment." —*Athenæum*

A Treatise on the British Freshwater Algæ. By G. S. WEST, M.A., A.R.C.S., F.L.S.

Demy 8vo
167 illustrations
10*s.* 6*d.* net

"Its aim is stated as 'to give the student a concise account of the structure, habits, and life-histories of Freshwater Algæ, and also to enable him to place within the prescribed limits of a genus any Alga he may find in the freshwaters of the British Islands.' To do this within the limits of an octavo volume of less than 400 pages, in which are numerous illustrations, is a task possible of accomplishment only by one very familiar with the subject and skilled in concise expression; but that it has been successfully done, will, we think, be the verdict after testing the book thoroughly."—*Nature*

London, Fetter Lane: CAMBRIDGE UNIVERSITY PRESS: C. F. CLAY, Manager

Subscriptions to the Journal of Botany (16s. post free) for 1910 should be sent to West, Newman & Co.

No. 571 JULY, 1910 Vol. XLVIII

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

A new *Musa* from Uganda. By A. [illegible] F.R.S., and S. Greves, B.Sc. (Plate 506) 169

Lathyrus tuberosus in Britain. By Miller Christy, F.L.S. .. 170

Natural Selection and Plant Evolution. By A. R. Horwood .. 177

Uva-ursi versus *Arctostaphylos*. By Frederic N. Williams, F.L.S. 183

Notes on the Flora of Flintshire. By the Rev. W. Moyle Rogers, F.L.S. 184

PAGE

Short Notes.—The Generic Name of the Yellow Rattle—*Sphærocarpus californicus* in Gloucestershire—Surrey Plants—Note on Rosa—"New Records"—Plant Records 185

Review:—

Common Weeds of the Farm and Garden. By Harold C. Long, B.Sc., in collaboration with John Percival, M.A., F.L.S... 189

Book-Notes, News, &c. 190

Supplement.—The British Roses. By Major A. H. Wolley-Dod (continued).

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this respect, other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains.

In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had price 1s. 6d. each.

AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

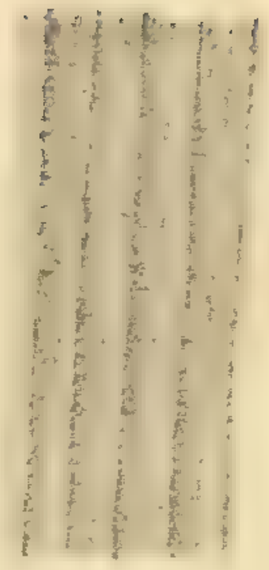
2 pages	25 copies	4s.	4 pages	25 copies	5s.	8 pages	25 copies	8s. 0d.
,,	50 ,,	5s.	,,	50 ,,	6s.	,,	50 ,,	9s. 0d.
,,	100 ,,	7s.	,,	100 ,,	8s.	,,	100 ,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

1/2



2

3

4

1

6

7

2/3

5

P. Highley del. et lith.

West, Newman imp.

Musa Bagshawei *Rendle & Greves.*

A NEW *MUSA* FROM UGANDA.

By A. B. Rendle, D.Sc., F.R.S., & S. Greves, B.Sc.

(Plate 506.)

This interesting new banana was found by Dr. A. G. Bagshawe, after whom it has been named, at Foweira and other places in Unyoro, in the Uganda Protectorate. The plant is 16 to 18 ft. high, and Dr. Bagshawe describes the stem as swollen below, and 6½ ft. in circumference six inches above the ground. The leaves, which are oblong with a narrow red edging and red midrib, are 11½ ft. long and 2 ft. 5 in. in greatest width; they are borne on a short very deeply grooved stalk. The drooping inflorescence is 2½ ft. long, with dull red bracts; the lower withered bracts exceed 45 cm. in length, those subtending the flowers are 26 to 27 cm. long. The flowers are about 5·5 cm. long, with a white perianth, the longer limb 3·7 cm. long and ·8 cm. broad enveloping the base of the shorter, 1·5 cm. long and 1·1 cm. wide; filaments 2·5 cm. long, anthers 2 cm. long; style about 2 cm., ovary 1·2 to 1·4 cm. long. The fruit is described by Dr. Bagshawe as "light orange, with a little darker pulp, 4½ to 5 in. long, 6 in. in circumference near the distal end, tapering to the proximal end, triangular; contains thirty black shining seeds"; the drawing has been made from a dried specimen. The seeds are 3- to 5-sided by compression, 1·2 cm. long by 1·3 cm. broad, hollowed at the hilum, broadening upwards and rounded above.

Musa Bagshawei sp. nov. Planta 15–18-pedalis, foliis oblongis, margine et costa media rubro-tinctis, petiolo brevi; inflorescentia pendente 2½-pedale; bracteis late oblongis, abrupte acuminatis, venis numerosis lineatis, florentibus 26–27 cm. long., 15 cm. lat.; floribus albis, 17–19 in quaque bractea, biseriatis; perigonio bilabiato, parte exteriore lineari-oblonga, apice trilobato, parte interiore late ellipsoidea plus quam duplo breviore sed latiore, apice aristata; staminibus 5 æqualibus, antheris linearibus perigonium et stylum excedentibus; fructu anguste ovoideo, seminibus circa 30, atris, nitentibus.

Hab. Foweira, Unyoro, at 3500 ft. alt.; in flower and fruit, April 25, 1907. No. 1582.

The species is most nearly allied to *M. Laurentii* De Wild. (Mission E. Laurent, p. 371, t. cxxx.) from Stanleyville, Congo, but differs in its broader acuminate bracts, and in the number of the stamens, *M. Laurentii* having (according to the figure) a smaller sixth stamen; judging from the figure of *M. Laurentii*, the fruit of that species contains fewer seeds than is the case in *M. Bagshawei*.

Explanation of Plate 506.

Fig. 1. Bract with one series of flowers, two-thirds nat. size. 2. Portion of same showing veining, nat. size. 3. Flower, nat. size. 4. Fruit, half nat. size. 5–7. Seeds viewed from the side, from above, and from below respectively, nat. size.

LATHYRUS TUBEROSUS IN BRITAIN.

By Miller Christy, F.L.S.

This plant is of special interest to Essex botanists like myself. Not only was it first recorded in Britain from this county, but, even now, two of its very few recorded British localities are in Essex. A new locality for the plant has, moreover, been recorded recently in the adjacent county of Suffolk. I have been led, therefore, to devote some time to an examination of its status as a British plant, as to which nothing has been done recently, so far as I know. The following are the results:—

The first record of the plant in Britain was published in the year 1860, by Thomas Corder, F.L.S. (died 1874), of Kempston, in Bedfordshire. According to Gibson,* the plant had been first observed growing at Fyfield, near Ongar, in Essex, in the previous year (1859), not by Thomas Corder, but by his brother, Octavius Corder, a skilled chemist and botanist, who then lived at Fyfield Hall, and died, aged 81, on 5th January 1910, at Brundall, near Norwich. The discovery was, however, recorded by Thomas Corder, who, writing on 20th August, says † that the plant was "found abundantly in almost every cornfield and hedgerow in the parish, and also in the adjoining one of Willingale Spain, and probably in High Ongar. In some places [he continues], it is so abundant as to damage the corn; and it has grown in the same fields for the last sixty years at least, according to the testimony of old men living at Fyfield, so no doubt can exist as to its being a truly wild plant. I suggest that it may be called the 'Fyfield Pea.'"

Shortly after this, the late Mr. Joshua Clarke, F.L.S., of Saffron Walden, recorded further facts in regard to the plant at Fyfield, which place he had visited in August 1860:—

"The plant grows abundantly [he says ‡] in the hedgerows, and in large quantities on the borders of cultivated fields, and among corn. It appears extended more or less over the parish and in the adjoining one of Willingale Spain—an extent of about three miles. There is no appearance whatever of its being an introduced plant. The farmers speak of it as growing on their lands for fifty years, and one stated he had known it for sixty years. They call it 'Tine Tare.' What appears to me so remarkable is that so beautiful a plant should not have been observed before. . . . It is very conspicuous as you pass along the road."

The plant still grows at Fyfield, where I have seen it many times, though never in quite the abundance described above.

It appears, however, that, long before Corder observed and formally recorded the plant at Fyfield, it had been known, on more or less unsatisfactory evidence, to grow at various other localities in England (including, even, one other in Essex). But

---

* *Flora of Essex*, p. 88 (1862).

† *Zoologist*, p. 7165 (1860); see also *Gardeners' Chronicle*, 25 August 1860, p. 774.

‡ *Journal of Linnean Society*, v. pp. 187–188 (1861).

this fact was practically unknown to British botanists; for these other localities were either recorded in a most unsatisfactory manner or were totally unrecorded. It will be well to state the facts as far as they can now be ascertained.

On the 31st August 1860, ten days after Corder had published his record already quoted, the late Mr. H. W. King (1816–1893), of Leigh, Essex, long well known as Honorary Secretary of the Essex Archæological Society, wrote as follows*:—

"From the description recently given in the *Gardeners' Chronicle*, and inserted in your last *Gazette*,† of a supposed new British plant growing at Fyfield, I believe it to be the same plant which grows in great profusion in a certain marsh in Canvey Island, there known as 'Gay Mead.' It closely resembles what is commonly called the 'Everlasting Pea,' but is much smaller.

"Canvey Island having been embanked and drained by a colony of Dutchmen who established themselves there in 1622,‡ I concluded, when I first saw the plant, that it had been most probably introduced by them, especially as I found evidence of its existence on the spot for the space of nearly a century. On showing a specimen to an eminent floriculturist, he at once named it *Lathyrus tuberosus*, and told me it was brought from Holland about the year 1506,§ thus confirming my conjecture.

"As it is confined to a single marsh, which is completely overrun with it, it was no doubt originally sown there for some specific use—perhaps (as the roots are said to be edible‖) for food; and [it] may have been introduced into Fyfield for the same purpose, and very likely about the same period.¶ The roots descend to so great a depth that I was informed that its extirpation is impossible.

"I never saw it growing elsewhere; but, if the Fyfield plant be the same, it is easily recognized."

It is clear that Gibson knew nothing of this record when he wrote (1862), for he makes no mention of the occurrence of the plant on Canvey Island. Indeed, Mr. King's record has been generally overlooked, and has remained practically unknown to English botanists, even to the present day, in consequence of its not having appeared in a recognized botanical journal. Nevertheless, there are in the British Museum specimens of the plant, gathered on Gay Marsh, by Dr. B. Daydon Jackson, as long ago as 20th July 1870.**

Others have since seen the plant on Canvey Island. Thus, in

---

* *Essex and West Suffolk Gazette*, 14 Sept. 1860, p. 8. His remarks (which were signed "H. W. K." merely) were reprinted in *The Cottage Gardener*, 25 Sept., p. 391.

† 31 Aug. 1860, p. 6.

‡ Apparently they came at least one year earlier, for the date 1621 appears on one of the two "Dutch houses" which still remain on the island.

§ On whose authority this statement was made, I know not.

‖ See *English Botany*, iii. p. 106 (1864).

¶ It is said that the tubers are sometimes cultivated in this country and are known as "Dutch mice" (see *Gardeners' Chronicle*, 25 Aug. 1860, p. 774).

** Whether the marsh is so called because, in summer, it is (or was) "gay" with the very beautiful flowers of this pea, I cannot say.

1881, the Rev. M. C. H. Bird, of Brunstead Rectory, near Norwich (who knew nothing of Mr. King's record quoted above), re-discovered the plant on Gay Marsh, of which he is, I believe, the owner. In the course of last year, Mr. Bird (believing the locality to be new and unrecorded), sent me specimens, gathered from cornfields bordering Gay Marsh, which is itself now laid down to grass. These specimens I exhibited at a meeting of the Essex Field Club on 30th October.

In 1889, some thirty years after King wrote, the late Mr. Joseph Clarke, F.S.A. (1802–1895), of Saffron Walden (a brother of Mr. Joshua Clarke above mentioned), published additional information as to the plant on Canvey Island, derived personally, no doubt, from King, with whom he was intimate. Mr. Clarke says* that, according to a tradition in the King family (which had long owned land on the island), the plant had been known to grow on the marsh named, not for one hundred years only, but for at least one hundred and fifty years. Alluding to its tubers, he says that "the pigs, after harvest, will root the ground in search of them."

To the foregoing statements, Mr. Clarke adds that *Lathyrus tuberosus* had also been "found at Bowers Gifford," a parish on the mainland, adjoining Canvey Island, from which it is separated only by a narrow creek. I have seen no specimens of the plant from this place, and have no futher evidence of its occurrence there. If Mr. Clarke's statement is correct, the plant has, no doubt, extended or been carried to Bowers Gifford from Canvey Island.

Another locality at which the plant had been found growing in Britain before 1860 (when Corder recorded it from Fyfield and King from Canvey Island) was in Devonshire. Mr. T. R. Archer Briggs says† that, about the year 1856, he noticed the plant growing "on the first embankment from Plymouth, by the side of the Laira Estuary." He was then in ignorance as to what it was; but, later, having identified the species, he searched for it there in vain. He saw no more of it until June 1871, when he found "about five small patches, all near together," growing in the old spot.‡ The locality was, he says, "much frequented"; and he expresses the opinion that "its showy flowers could scarcely fail to have been observed had they been regularly produced in the intermediate seasons"—a conclusion with which it is not easy to agree. Mr. Briggs's record attracted little attention, probably because the circumstances left no reasonable doubt that, in the locality in question, the plant had been introduced by shipping from the Continent.

Exactly the same may be said of another English locality, at which the plant had been observed, for the first time, only a few weeks before Corder observed it at Fyfield. Mr. Alexander Irvine

---

* *Essex Naturalist*, iii. p. 274 (1889).

† *Flora of Plymouth*, p. 99 (1890).

‡ Specimens gathered by Mr. Briggs, at the spot indicated, on 19th June 1871, are in the British Museum.

says* that in May or early June 1860, he had found "a single plant of *Lathyrus tuberosus* at Wandsworth steam-boat pier." This he removed to his garden, where it flourished; and, when the species was recorded from Fyfield, he examined and identified the plant, which he had failed to recognize until then.

There is, indeed, some evidence that the plant had been found growing, both in Lincolnshire and in Suffolk, long before the date of any of the records cited above. Nearly fifty years ago, the late Rev. W. W. Newbould pointed out† that, in the herbarium of the Rev. Adam Buddle (died 1715), now in the British Museum there is a specimen‡ (which is correctly identified) to which Buddle evidently refers in his "Methodus Nova Stirpium Britannicarum," wherein he says§:—"I had it from y^e^ Rev^d^ Mr. John Sedgwick, who gathered it not far from Lincoln, in y^e^ north field of Blankney, near y^e^ road to Lincoln." He identifies it as the "*Lathyrus arvensis repens tuberosus*, the Pease Earth-nut," of Gerard, Parkinson, and others.‖ Again, Mr. Britten has quite recently pointed out¶ that there is now in the British Museum a specimen (also, apparently, quite correctly identified), formerly in the herbarium of Samuel Dale (1659–1739), of Braintree, and labelled "A. R^o^ D^r^ Buddle multo abhinc annis accepi, qui in agro Suffolkiæ invenit" (I received this, many years ago, from the Rev. Mr. Buddle, who found it in the county of Suffolk). Buddle's "Methodus," which was never published, is in the library of the British Museum at Bloomsbury.

It is necessary, however, to view with some suspicion both these early records. Everyone will recognize that, in the case of very old collections, there is always considerable risk that the specimens or their labels may have become mixed. In this case, too, it will be noticed that both the records are associated (though in different ways) with the name of one man (namely, Buddle), which, of course, increases the possibility of error. It is true, no doubt, that Buddle was a careful and accurate botanist; but it should not be overlooked that the evidence connecting him with the old specimens in question is neither clear nor conclusive. In the case of the Suffolk specimen, we have no statement at all from Buddle in regard to it. All we have is a statement by Dale (in

---

* *Phytologist*, iv. p. 318 (1860).

† See *English Botany*, iii. p. 105 (1864), and Gibson, *Flora of Essex*, p. 88 (1864).

‡ Buddle Herbarium, vol. vi. (Herb. Sloane, 119), fo. 23.

§ Sloane MS. 2978 [not 2972, as given by Gibson], fo. 107b.

‖ This species (whatever it may have been) was recorded in Britain and figured by Gerard in 1594 (*Herball*, p. 1057). It grew, he says, "in corne fieldes, both with the corne itself, and also about the borders of fields, among briers and brambles." Some botanists, judging from Gerard's figure and his description of the habitat of the plant, have concluded that the pea in question was *L. tuberosus*; but there can be no reasonable doubt that it was really *L. macrorrhizus*, which also produces tubers on its roots. Ray, however (identifying it, apparently, with *L. tuberosus*), says of it (*Hist. Plantarum*, i. p. 895, 1686): "In Anglia, quod sciam, spontanea non occurrit."

¶ *Journal of Botany*, 1909, p. 353.

whose herbarium it was) to the effect that he had it from Buddle, who had found it, many years before, in Suffolk. Nevertheless, this Suffolk record seems, of the two, the less open to suspicion; for, as stated already, a Suffolk locality for the plant has recently been recorded. Turning to the Lincolnshire specimen, we find that, although we have a statement by Buddle himself in regard to it, he does not claim to have collected it himself, but says that it had been collected by a certain Rev. John Sedgwick, from whom he (Buddle) had received it. The reverend gentleman named (of whom I know nothing) may or may not have been a careful and reliable botanist. In any case, there is, I believe, no other record of the plant from Lincolnshire; and, in view of this fact, it is not easy to accept the record in question without reserve. It is certainly a curious coincidence, however (as the Rev. E. A. Woodruffe-Peacock has been good enough to point out to me), that Lincolnshire, like Canvey Island, was embanked in the seventeenth century by Dutchmen, who may have brought the plant to both places. However this may have been, in Buddle's time "the north field of Blankney" was (as Mr. Woodruffe-Peacock informs me) an unenclosed area of between one thousand and two thousand acres. It was enclosed and placed under cultivation in the early years of the nineteenth century. Mr. Woodruffe-Peacock has endeavoured to ascertain if the plant has been seen on the ground in question within recent years, but has failed to hear of it. This goes to throw further doubt upon the record; for, as mentioned hereafter, the plant is nearly ineradicable; and, if it ever grew there, it would probably grow there still. In any case, it not easy to believe that Buddle, alone among the early botanists, had a plant so rare in Britain from *two* different English counties.

Summing up thus far (that is, to the year 1860), we find that (ignoring two old and doubtful records and two cases in which the plant was clearly an introduction) *L. tuberosus* was known to grow in *only two localities in Britain*, both of them (Fyfield and Canvey Island) being in the county of Essex.

This state of affairs continued to hold good for nearly thirty years—that is, till 1888, when the plant was recorded from Sussex by the Rev. F. H. Arnold, who says* that it was found by Mr. R. D. Postans "on the shingle beach at Eastbourne, in full flower, in the first week of August." A figure which accompanies the record seems to show that the species is correctly identified. The locality is more precisely indicated by some specimens now in the British Museum, which are labelled as having been gathered by Mr. F. C. S. Roper, on the 3rd July 1889, on the "shingle Beach, near tramway, about ½ mile from high road, beyond Norway cottages."† Whether or not the plant still grows there I cannot say.

---

* *Science Gossip*, xxiv. pp. 224–226 (1888); see also *V. C. H. Sussex*, i. p. 41 (1905).

† These plants differ somewhat from the usual type, being slightly stunted and less free in habit, with narrower (almost lanceolate) leaves; but their identification appears to be correct.

In recent years, *L. tuberosus* has been found growing in at least three spots round the British coasts, all of them in or closely adjacent to ports or navigable rivers. In these cases, as in those at Plymouth and Wandsworth already noticed, there can be no reasonable doubt that either the plant itself or its seeds or tubers had been brought by shipping from abroad, very likely among ballast. Thus, in July 1900, Mr. Edward Potts found specimens growing, with other alien plants, "by the railway near Bradbury Station, near Darlington," at a spot where the railway officials said they had seen it growing "for at least ten years."* There are specimens collected by him in the British Museum. Other specimens, collected by the Rev. H. J. Riddelsdell, in Cardiff Docks, on the 10th August 1907, are also in the British Museum. Mr. Riddelsdell has been good enough to inform me that he found it in one spot only and in small quantity. At King's Lynn, in Norfolk, too, the plant has been found growing in very similar circumstances, "a well-known botanist" having informed Mr. Rasor† that, some years ago, he saw specimens among various introduced plants growing around the docks there.

The most recent record of the discovery of a new British locality for *L. tuberosus* is different in nature from those immediately foregoing, inasmuch as it is inland. Mr. John Rasor says‡ that, in the summers of 1907 and 1908, he found the plant growing abundantly among gorse and bramble in the vicinity of Woolpit, in Suffolk. In recording his discovery, Mr. Rasor expressed his belief that his was the first record of the species as growing in Suffolk; but the existence, in Dale's herbarium, of a reputed Suffolk specimen has been noticed already.

The foregoing records as to the occurrence of *L. tuberosus* in Britain raise the question:—Is this plant to be regarded as a native or as an introduced species?

It will have been noticed that Corder, in recording the discovery of the plant at Fyfield, expressed his opinion that it was "truly wild" there. If by this he meant that he considered it indigenous, he must have formed his opinion rashly; for one can hardly regard as truly native any plant which is known to occur in only one single locality in all Britain (as was then the case with the species in question), yet was so striking that it could hardly have been overlooked elsewhere.

Hooker & Arnott, writing§ immediately after the discovery of the plant at Fyfield, threw doubt on its being a true native, as also did Gibson,‖ a writer (? the Rev. W. W. Newbould) in the *Phytologist*,¶ and other botanical writers of the period.

Later writers seem to regard in a more favourable light its claims to be considered a native. Thus, the Messrs. Groves mark it** as "possibly introduced, but now naturalized"; while Mr.

---

* *Journ. Bot.* 1900, p. 359.
† *Ibid.* 1909, p. 31.
‡ *Ibid.*
§ *British Flora*, p. 606 (1860.)
‖ *Flora of Essex*, p. 88 (1862).
¶ *Op. cit.*, v. pp. 186–188 (1861).
** Babington's *Manual*, p. 102 (1904).

F. J. Hanbury apparently accepts it* without any hesitation as undoubtedly indigenous, and this without taking into account its recorded occurrence in Sussex, for he gives its index-number as 1 (referring, doubtless, to Essex).†

Looking impartially into the probabilities and improbabilities of the case, one finds it difficult to agree with those who have regarded *L. tuberosus* as truly native in Britain.

It is true that the plant has now been recorded, on reasonably good authority, as growing apparently wild in three English counties (Essex, Suffolk, and Sussex), while an old (and questionable) record says that it grew formerly in one other county (Lincolnshire). Yet this counts for little in view of the fact that the plant is one which is very likely to have been, and to be, introduced into this country, either by design or accident, or both. Its crimson flowers are handsome enough to render it of interest to the gardener, and its edible tubers are sufficiently palatable for it to have been cultivated specially for them, as appears to have been done on Canvey Island. Moreover, as the plant grows readily among standing crops of grain, its seeds might very easily be imported, quite by accident, among seed-corn. Nor would the plant have far to travel; for it is common in France, Holland, and Germany, and is widely distributed over the Continent of Europe. In any case, it is impossible to doubt that the plants found growing near Wandsworth, Plymouth, and Darlington, and around the docks at Cardiff and King's Lynn, had been imported by shipping, probably with ballast. Moreover, the fact that two other recorded British localities for the species (namely Canvey Island and Eastbourne) are also by the sea is not without significance in this connection. The other two recorded British localities for the plant (namely Fyfield and Woolpit) are, it is true, inland—some thirty and thirty-five miles respectively from the sea; but both are in corn-growing districts, to which seeds of the plant might very easily have been carried with seed-corn.

On the whole, therefore, it seems reasonable to regard the plant as an introduced, not as an indigenous, species. If it had been truly indigenous, it is almost certain that we should have found it growing in this country in many more localities than the four from which it has been recorded; for, in those localities and wherever it is met with on the Continent, it grows in fair abundance. It must be remembered, moreover, that, owing to the number of tubers, deeply buried in the ground, which the plant produces on its roots, and to its habit of fruiting freely, the species is one which it would be almost impossible to eradicate from any locality where it had ever become established, whether naturally or by introduction.

Yet, though the plant appears to be an alien in this country,

---

* *London Catalogue*, 10th ed. (1908).

† The Suffolk locality, mentioned above, was not recorded when Mr. Hanbury wrote.

it is clear that it must have been introduced at a comparatively early date, for (even ignoring the old and doubtful Lincolnshire and Suffolk records) it has been known to grow on Canvey Island since at least 1730, and at Fyfield since at least 1800.

For help in various ways, my thanks are due to Mr. E. G. Baker, the Rev. M. C. H. Bird, Prof. G. S. Boulger, Mr. James Britten, Dr. B. Daydon Jackson, the Rev. E. A. Woodruffe-Peacock, the Rev. H. J. Riddelsdell, Mr. Arthur Smith, and others.

NATURAL SELECTION AND PLANT EVOLUTION.

By A. R. Horwood.

From time to time in every branch of scientific work it behoves us to glance back at the past efforts that we and our contemporaries have made towards the accomplishment of some ideal or the solution of some problem that we have set before us.

The present appears to me to be one of those periods of retrospection or introspection that come to each generation upon the dawn of a new or the eve of a past era. The celebration of the Darwinian centenary marks the close of a glorious record of discovery and progress; and the correlated recent discovery of new elements, *e.g.* radium, and a new mode of locomotion, flight, brings us to the dawn of a new century and a new epoch.

This being so, it is fitting to cast the mind back in reflection upon the results obtained by an application of the Darwinian methods to the evidences of the working of evolution amongst plants in the past. For if anything has been of striking import in the world of palæontology during the past twenty years or so—or we might limit it to ten—it is the remarkable progress made in the study of palæobotany or of our knowledge of fossil plants.*

Let us see how far then those discoveries warrant us in drawing any general conclusions therefrom as to plant-evolution.

The question as to how far Natural Selection has worked in the past can, we must admit at the outset, hardly as yet be answered. Anyone who is intimately acquainted with palæobotanical literature and work during the last half of the nineteenth century, will readily acknowledge the inability (at present) of palæobotanists, even now, to write glibly of the work of natural selection, if, as is thought, it is possible to trace its agency at all amongst such plastic organisms as plants. But the layman may not think so, hence these remarks.

Work amongst fossil plants, when not concerned with the systematic study of species, and the recognition of zones in the

---

* *Vide* especially Dr. D. H. Scott's *Studies in Fossil Botany*, a general guide to recent scientific discoveries summarizing the detailed monographs published by him on different types of Carboniferous plants.

rocks,* has been largely concerned with the very gradual accumulation of evidence, bit by bit, as to the morphological significance of certain organs. It has not even begun to assume an etiological aspect. Palæobotanists are not so fortunate as palæozoologists as regards the nature of the material they are called upon to examine, for the majority of the remains found—and they are never or rarely complete—are fragmentary; whilst even when the internal structure has been preserved, it is only again capable of being investigated in thin sections insignificant in area.

The whole of the organs or parts of a species are very seldom all preserved together at the same time and found at the same place, in the case of any one specimen. Hence, in the case of palæobotany, of which we are speaking, work has been much slower. Palæontologists are not called upon to exercise their imagination so frequently as palæobotanists; and it is only recently that it has been possible to reconstruct a single species, or to procure models† of their structure.

Then, again, the so-called "wealth of material" has, as a matter of fact, only come to light of recent years, and through the labours of Williamson and his collaborator Dr. Scott (who now carries on and synthesises the work of a quarter of a century or more) has more recently still been utilized to the best advantage only through the rapid advance of modern technique and improvements in the making and the mode of examination of sections, as well as by the collateral progress made in the powers of the microscope. This material has, moreover, been obtained mainly from the lower part of the Coal Measures, and it is practically only in Lancashire that such petrified material, obtained from the coal-balls which have been exploited on a large scale only within the last ten years, is readily available in England; and whilst in France petrified material is much rarer, and it is more often silicified in character, much of the progress made there was "set back" by the inevitable retardation caused through the misconceptions of the broad characters of the plants and the confusion made between secondary thickening in stems and gymnosperms in the case of *Calamodendron*, *Sigillaria*, &c.

Indeed, fossil plant work has been absolutely confined more or less to the Coal Measures (or Permo-Carboniferous) and the Jurassic; that is to say, the floras of the Cambrian, Ordovician, Silurian, Devonian, Old Red Sandstone, Triassic, Liassic, and very largely the Cretaceous and Tertiary formations such as they are in Great Britain, have received very little attention. What has been done in these latter, for which—especially in regard to the Jurassic and

---

* I may say here that I am at present engaged upon a study of the Carboniferous Flora of the Midland Coalfields, a work I have been pursuing some years, and in which I am now aided by a grant from the British Association. One of its objects is to obtain some clues as to the past origin of the types of plants then dominant.

† Pioneer work in this direction has been done by Mr. H. Smedley, who has already constructed a most interesting series of models in wax of the palæozoic seed-plants and other important groups.

Wealden formations, Professor A. C. Seward, F.R.S., is chiefly responsible—has been confined to systematic work, or to isolated investigations upon the structure of solitary—and, as regards their preservation, more than usually fortunate—types of plants.

The inevitable concentration of knowledge and progress around two distinct *poles*, as it were—the Carboniferous (in England) and Jurassic formations (in America), wedged in between voids of knowledge—as to the particular points at any rate established by a study of the former—in pre-Carboniferous and post-Jurassic times, as well as in the intervening hiatus of time during Permian and Triassic epochs, has naturally had the effect of concentrating it around those poles more or less, and stimulating research in directions opposed to the study of synthetic relations, such as those of Natural Selection. The very fact of this concentration around two definite but separate points has doubtless had, in some ways, a harmful effect upon the study of the other formations named, which has thus somewhat fallen into neglect—in England at least. For the enterprising worker has chosen the more promising field, thereby leaving the rest to take care of themselves until, by the law of averages, some one or other turns up to fill in the blanks in our knowledge of the floras of those formations which, in his eagerness and enthusiasm to follow up that which has promised him a more lucrative or profitable field, he has hitherto regarded as barren of interest or objects for research.

But it is a good thing that there are still men in this age of rush and scramble who will have the qualifying determination to probe patiently but persistently into the unknown, and to await results during years of careful and dogged research. It is to be hoped that this mode of procedure will come to be again the rule, as it is now the exception, though the distinction of a few.

For the very reason, then, that work has been so concentrated around two special epochs of past time, it has been—and I venture to say will yet be—largely analytical for a long time to come.

Consequently, indications of the existence of such a factor as Natural Selection have been confined to a few well-known genera, where the structure has been exhaustively investigated, and the evolution of certain structures, *e.g.* the pollen-tube and embryo, has become pretty well known. But in these cases only isolated phenomena are presented, so that what may really be actual facts must still be regarded only as inferences. Much work is even now being concentrated upon the elucidation of the structure and relationship of the embryo, embryo-sac, and other elements connected with fertilization and seed-formation, not only in the case of fossil plants, as instanced by work upon the dicotylous *Bennettites*, but also recent plants, especially amongst Gymnosperms and Angiosperms. The studies made upon *Welwitschia* by Dr. Pearson in South Africa and by Miss Berridge upon *Ephedra* are only two instances among many.

Indeed, botanists generally are not, and need not be, in any hurry to come to so-called "final" conclusions.

Whilst not attempting at this stage to justify the collateral working of Natural Selection amongst fossil plants, indicated broadly in many directions, simultaneously with that recognized amongst fossil animals, it may be worth while, perhaps, to add a further instance of the *apparent* working of Natural Selection amongst fossil plants.

I refer to the existence in *Calamites* (vide *Nature*, 1909, June 17, p. 478) of a short internode which is homologous with a similar short internode in the recent *Equisetum*. In *Calamarieæ* there was an alternation of branched and branchless whorls with internodes increasing in length from below upwards in *Calamitina*, but in *Eucalamites* (another subgenus of *Calamites* in the wider sense) there was a succession of short internodes. At an early stage in *Stylocalamites* there was a series of internodes as in sterile *Equiseta*, increasing upwards in length. Thus in the *Calamarieæ* the process, which was probably an adaptation serving to increase strength, was much more complicated, and it remained for climate and other factors (physical) to bring about a simplification of this process. Coincidentally with this, morphic changes of a more permanent nature doubtless took place.

This we find in the recent *Equisetum* (which on other grounds also we regard as a reduced form) in a simpler form. It may be traced in the Carboniferous and later species of *Equisetites*, and in the Tertiary and post-Tertiary *Equisetum*, so that on broad lines we may trace a gradual evolution of a process elaborated from a succession of primitively unequal internodes by which strength was acquired by a branch or cone-bearing node.

It should be noted that here, as in *Calamarieæ* and the other great arborescent Carboniferous genera (*Lepidodendron*, *Sigillaria*, &c.), physiological factors have played a great part,* and the necessary adaptation has been effected.

Physiological factors played as great a part in the differentiation of the two great groups of Angiosperms, namely monocotylous and dicotylous forms. Plants are, perhaps, more plastic than animals, and lend themselves to the influence of *environment* more obviously than the latter. They may thus obscure morphic changes. Probably in no case are physical and morphic factors ever found to act independently of each other, but the one may be more obvious or apparent than the other, and so much so as to obscure the other. This is no argument for their non-existence. Morphic changes are often the visible result of an antecedent physical cause. At the same time the reaction of an organ upon another may be quite invisible, and still morphic. It is owing to these features and the existence of morphological equivalents, or the existence of parallel but unrelated lines of development, that

---

* Thus one is inevitably drawn to conclusions arrived at by the Neo-Lamarckian school, of which, through his elaborate study of Fossil Cephalopods, the late Professor Alpheus Hyatt was the foremost exponent.

so far, apparently, fossil botany is unable to dogmatize as to how this or that species has been evolved.

When we know more as to the complete life-history of a number of closely related species of fossil plants, we may, like our far better-informed brother zoologists, attempt to say how Natural Selection has worked. For the present we must have recourse to a "*suspensio judicis*." But we may remark here that there is a recapitulation of characters in the ontogeny of living plants consonant with the accepted progressive evolution of plants in the past or their phylogeny. In the meantime, however, it is better to speak of Natural Selection, not as an *agent* but as the *result* (correlated with physical selection of which with morphic changes it consists) of the struggle for existence.

Indeed, Evolution itself is, rightly considered, only the outcome of the adjustment of the organism to its environment * *plus* the consequent resulting re-action of the organism itself.

The process of evolution, as exhibited by heredity or variation, is analogous to that of the formation of character in man—to differentiate, for sake of comparison, between genetic and mental or psychic processes; the latter really being included in the former in any ideal philosophy, which must ever be the mentor (not the pupil) of "Science" (or "Natural Science").

As to whether it is necessary to regard the evolution of the great ranks of plants in time as the outcome of Natural Selection alone, or partly, or even not at all, it must further be remarked that we have really only evidence of what are, perhaps, best called *adaptations*. Since Natural Selection does its work in one way at least (and it is after all only an intermediary, not a cause, at least not a *vera causa*, as some would have it) by these adaptations, that is to say, by rejecting the useless and retaining the useful adaptations—if indeed we are warranted in drawing any such distinction—we may, presumably, speak tentatively then of the work of selection, whether we term it natural or physical. In reality, in many of the cases in point, only physical selection can be traced.

The action of organism upon organism is, however, abundantly exhibited, in the Carboniferous Period, in the mode of deposition of the plants comprising the flora at that time. For we find at many horizons, where deposition *in situ* may well be argued to have taken place for long periods without cessation, that there is a predominance of certain types of an arborescent character. By the mere physiological extent of growth there is a restriction in the distribution of not only species and genera, but whole orders. Thus we find the well-known types prevailing almost to the exclusion of others, which linger on into entirely different conditions. The humid but warm climate was entirely unsuited to *Walchia* or *Voltzia*, which persist into post-Carbo-

* The existence of stationary and divergent, or of retrogressive, forms all bears this out; whilst that of progressive evolution testifies to the cumulative character of evolution, and the natural progress of perfection from simple to complex.

niferous floras. So the climate and other causes, such as the relation of land to water and earth to sun or other light sources of the epoch, gradually tended to exclude the huge arborescent Equisetales and Lycopodiales, and Cordaiteæ became gradually extinct. Not only have physiological factors caused the crowding out of recessive, dwarf, and weakly forms, but they likewise necessitated special adaptations, as we have seen in the case of *Calamites*, for the support of the abnormal stems.

Moreover, in the process of forming adaptations suited to the increased girth and height of their stems, the Carboniferous plants made a progressive step in stumbling upon—if we may use such a term—a structure which for long misled many of our older palæobotanists into considering them to be gymnosperms, that is, in attaining to the high state of specialization involved in stems exhibiting secondary wood. Once acquired, this adaptation, and the modification attending its incidence, was retained by all the plants higher in the scale, and thus became a valuable asset of the Carboniferous Period.

But—and we must admit the anomaly—instead of progressing themselves, these very same plants, such as the Equisetales (taking *Equisetum* as a modern type), have not evolved further, but have rather taken a downward or backward course and mode of growth and development, or have become reduced. Compare *Calamites* with *Equisetum*, *Lepidodendron* with *Lycopodium*, and we see to what a great degree they have retrogressed, even though their later intermediate ancestors or divergent forms—*Equisetites*, *Lycopodites*, &c.—may exhibit some approximation between the two forms, both in size and organization.

Now Natural Selection does not necessarily imply the existence or essential importance of any influence of environment upon plants in causing adaptations, but, as I have remarked elsewhere (*Nature*, 1908, July 16)—"we may regard it as feasible that modifications are indirectly due to the influence of energy and memory on the germ-plasm, the specific-type preserver, and that heredity or variation may be influenced in nature by the characters acquired by incidence of physical surroundings, whilst a response in an organism to outside stimuli creates a reponse from within, stimuli acting from within and without, re-acting upon one another." Before an adaptation can take effect, it must have been stimulated previously by some cause, and this is either external or internal to the organism. Since the latter are usually first brought into action by the former, the adaptations must be due mainly to external factors, which themselves in turn act upon the organism.

Doubtless these adaptations, aided by what De Vries terms mutations or sudden appearances of slight deviations or forms with differences in structure which may become fixed, may be all that we can visibly predicate as to the course of evolution in the past, and as to how and why the present-day forms have evolved from a previous series. But that they have thus evolved we know or generally admit, and we know that there have been vast

and periodic climatal and other changes. Also we know from the early life-history or ontogeny of living species that a certain progressive development has taken place. If zoologists adhere to the decision that what we observe in plants has taken place in the case of animals * by means of Natural Selection, we must bow to their superior knowledge as to the cause in accepting (or not) the validity of our analogy as to the fact.

UVA-URSI VERSUS *ARCTOSTAPHYLOS*.

By Frederic N. Williams, F.L.S.

In tracing back the history of the eight British species of *Siphonandraceæ*, it becomes necessary to verify the references and authorities for their current names. The current name of the common Bearberry is *Arctostaphylos Uva-ursi* Sprengel, Syst. Veget. ii. p. 287, and it dates from 1825. It was included by Linnæus among the species of *Arbutus*, as *Arbutus Uva-ursi* (1753).

Arbutus and *Uva-ursi* are two genera which were well defined and characterized by Tournefort, and were without any adequate reason indefensibly united by Linnæus. The present view that the two genera are quite distinct was current even soon after the time of Linnæus. The name of *Arctostaphylos* was proposed by Adanson, Fam. Pl. ii. p. 165 (1763), but is there no more than a "nomen semi-nudum," as the two or three words of diagnosis are too vague to characterize it, and there is no indication as to which or how many of the Linnean species of *Arbutus* should be referred to it. But, fortunately, this, like so many of the barbarous generic names factitiously invented by Adanson, can be dropped in favour of an earlier restoration of Tournefort's genus of *Uva-ursi* characterized and published after the first edition of *Species Plantarum*, the starting-point for the names of both genera and species adopted by those who are in accord with the Vienna recommendations.

A work that seems to have been altogether overlooked by students of nomenclature is the fourth edition of the Abridgement of Miller's *Gardeners' Dictionary*, published in 1754, a year after the first edition of *Species Plantarum*. This octavo work is for convenience divided into three volumes (unpaged like the folio editions), and is stated on the title-page to be abridged from the sixth folio edition of 1752. The Abridgement, so far as I have tested it, consists not in the shortening or condensation of the longer articles but in the omission of the unimportant ones. It is therefore entirely a matter of scissors. There seem to be very few copies about of this edition of Miller's *Gardeners'*

---

* In the case of the Cephalopoda I can speak from some acquaintance with the main types of fossil forms.

Dictionary. The description of the genus *Uva-ursi* is therefore here transcribed :—

"It hath a globular bell-shaped Flower, consisting of one Leaf, from whose Empalement arises the Pointal, fixed like a Nail in the hinder part of the Flower; which afterward becomes a soft Berry or Fruit, of a spherical Form, inclosing hard Seeds, which are some plain, and others gibbous.

"There is but one Species of this Plant at present known; *viz*. Uva Ursi. Clus. Hist.—*Spanish Redwhort*. This plant is very near akin to our common Whorts or Bilberries: it rises about a Foot high, and hath several flexible Branches, which are covered with a redish Bark, somewhat like the young Branches of the Strawberry-tree: these are thinly beset with oblong stiff green Leaves which are serrated on their Edges. The Flowers grow on the Top of the Branches, which are of a whitish-blue Colour: these are succeeded by red Berries, somewhat longer than those of our common Whorts, which have an acid Taste."

The two British species received names under this genus anterior to those which they bear under *Arctostaphylos*. They are :—

Uva-ursi procumbens Moench, Meth. Plant. Marburg. p. 470 (1794): = *Arbutus Uva-ursi* L. (1753).
Uva-ursi alpina S. F. Gray, Nat. Arr. Brit. Pl. ii. p. 401 (1821): = *Arbutus alpina* L. (1753).

NOTES ON THE FLORA OF FLINTSHIRE.

By the Rev. W. Moyle Rogers, F.L.S.

All the plants, except the Rubi, referred to in the following notes were observed by my son, F. A. Rogers, and myself so long ago as 1890; but as the localities are additional to those given in Mr. Dallman's papers published in this Journal for 1907 (pp. 138–153), 1908 (pp. 187–196, 222–230) and 1910 (pp. 40–53, 73–77, 90–98), and as some of them at least are not wholly unimportant, I think it well to give them here for what they are worth. The Rubi of which I have seen specimens have the sign ! after the localities.

Cerastium tetrandrum Curt. and *C. semidecandrum* Linn. Coast at Rhyl. I can find no mention of either of these species in Mr. Dallman's notes. In most years they disappear or are difficult to recognize before the summer has fairly set in, so he may not have looked for them early enough.

Arenaria leptoclados Guss. Mostyn.—*Sagina maritima* Don. Rhyl.—*S. apetala* Ard. and *S. nodosa* Fenzl. Mostyn.

Trifolium arvense Linn. Mostyn.—*T. striatum* Linn. Rhyl.—*Astragalus glycyphyllos* Linn. By canal near Mostyn.

Rubus fissus Lindl. Whixall Moss, near Fenn's Bank, *Wolley-Dod* !—*R. incurvatus* Bab. Caerwys, *J. H. Lewis*, British Museum specimen ! Bot. Record Club Report, 1879. Hawarden Park, &c.,

Ley.—*R. Lindleianus* Lees. "Hawarden Park, &c., common," *Ley.*—*R. rhamnifolius* Wh. & N. Mostyn! Hawarden, "common," *Ley.*—*R. pulcherrimus* Neum., *R. Selmeri* Lindeb., *R. lentiginosus* Lees, and *R. Sprengelii* Weihe. Hawarden Park, *Ley*!—*R. pyramidalis* Kalt. Lane towards Nant-y-Ffrith, *Wolley-Dod*, 1903!—*R. leucostachys* Sm. Hawarden Park, *Ley.* var. *gymnostachys* (Genev.). Wrexham Road, Hawarden, "frequent," *Ley.*! identical with the strong, highly glandular Bangor plant (No. 87, set of British Rubi).—*R. anglosaxonicus* Gelert. var. *raduloides* Rogers. Rhydymwyn, *Ley*! Weasel Lane to Nant-y-Ffrith, *Wolley-Dod*!—*R. Drejeri* G. Jensen, var. *Leyanus* Rogers, forma. Hawarden Park, *Ley*! *R. radula* Weihe. var. *echinatoides* Rogers. Rhydymwyn, *Ley*!—*R. botryeros* Focke (a 3-nate leaved form with rather deeply incised terminal leaflet). Hawarden Park, *Ley*!—*R. fusco-ater* Weihe. Near Weon and Nant-y-Ffrith, *Wolley-Dod*, 1903!—*R. dasyphyllus* Rogers. Mostyn! Hawarden Park; above Mold, "common," *Ley.*—*R. Marshalli* Focke & Rogers, var. *semiglaber* Rogers. Mold; near Moel Vammau, *Ley*!—*R. dumetorum* Wh. & N. var. *ferox* Weihe. Hawarden Park, *Ley.* var. *diversifolius* (Lindl.) St. Asaph! var. *raduliformis* Ley. Near Moldre, *Ley*, 1898!—*R. corylifolius* Sm. var. *sublustris* (Lees). Mostyn! Cilcyn, *Ley*! var. *cyclophyllus* Lindeb. Hope, *Ley*!—*R. Balfourianus* Blox. The Leete, under limestone crag, *Ley.*—*R. caesius* Linn. Mostyn! Hawarden Park, *Ley.*—*R. Chamæmorus* Linn. Cader Fronwyn, *C. C. Babington* (British Rubi).

Epilobium parviflorum Schreb. and *E. obscurum* Schreb. Mostyn.

Lythrum Salicaria Linn. and *Parnassia palustris* Linn. Near Mostyn.

Silaus flavescens Bernh. Mostyn.

Aster Tripolium Linn. Rhyl.—*Leontodon hirtus* Linn, and *Arctium minus* Bernh. Mostyn. — *Hypochæris glabra* Linn. Rhyl.

Blackstonia perfoliata Huds. and *Plantago media* Linn. Mostyn.

Carex arenaria Linn., *C. remota* Linn., and *C. sylvatica* Huds. Mostyn.—*C. extensa* Good. Rhyl.

Phleum arenarium Linn. and *Glyceria maritima* Mert & Koch. Rhyl.—*Holcus mollis* Linn. and *Bromus ramosus* Huds. Mostyn.

SHORT NOTES.

The Generic Name of the Yellow Rattle (pp. 53, 78).—Article 45 of the Vienna Rules deals with the case when a genus is divided into two or more genera. John Hill, in his *British Herbal* (1756), p. 121, took up the Linnean genus *Rhinanthus*; he described it in English, in accordance with the Latin description in the fifth edition of Linnæus's *Genera Plantarum* (1754), p. 263, n. 658. Hill's book was on its title, "A history of plants and

trees, natives of Britain, cultivated for use, or raised for beauty." The species of *Rhinanthus* which came within the scope of his work he arranged in two divisions, namely, "British species" and "Foreign species"; he gave two British species, "*Rhinanthus vulgaris*" and "*Rhinanthus foliis angustioribus*," both of which represented *R. Crista-Galli* L.; and only one foreign species, "*Rhinanthus foliis villosis*," which represented *R. indica* L., which has since been removed to an entirely different genus. With reference to this foreign species, Hill wrote: "This is a small but singular and pretty plant; . . . it is evidently a plant of this genus." At that time there were three other species, foreign ones, placed in the Linnean genus *Rhinanthus*, which really belong to two other genera, but it did not enter into Hill's plan to include them; he did not, however, express any opinion with regard to them, nor did he in any sense amend the genus or divide it into two or more genera. A similar remark applies to Hudson's *Flora Anglica* (1762), who gave a very short description of the genus, and adopted from Linnæus the only English species. It remains that neither of these two authors anticipated Haller in dividing the genus *Rhinanthus* L. into two or more genera. It appears, therefore, that the genus *Alectorolophus* Hall. properly takes the place of the former name for our plant.—W. P. Hiern.

Sphærocarpus californicus in Gloucestershire.—In the western portion of the county of Gloucester there is a narrow strip of Bunter Sandstone extending from Newent to Bromsberrow, and including a portion of Redmarley D'Abitot, in Worcestershire. In the sandy cultivated fields of this district I have found *Sphærocarpus* very plentiful, and the two species, *Michelii* and *californicus*, occur in about equal proportions. Mr. Macvicar had previously seen specimens of *S. californicus* only from a garden near Woking, in Surrey (see Journ. Bot. 1909, p. 306). The two common species of the genus *Riccia*, *sorocarpa* and *glauca*, are associated with the *Sphærocarpus*.—H. H. Knight.

Surrey Plants.—It would appear that there is in course of establishment, by the Thames near Putney, a small colony of plants that seem more at home along the muddy shores of the lower reaches of the river, whence the seeds have probably been tide-borne. My friend Mr. W. A. Todd, of Putney, recently reported a *Cochlearia* growing on the river-wall above that place. The plant, which I have seen, is a fine example of *C. anglica* L. Unfortunately, the flowers were sufficiently showy to be plucked. Last year the same observer detected *Triglochin maritimum* L. in this station; searching there with him, we found two clumps of this, and one small patch of *Glaux maritima* L. A sedge from this locality, gathered last year, in a somewhat immature condition as far as fruit is concerned, is named by Mr. C. E. Salmon *Carex divisa* Huds. In a parcel of Surrey plants recently received back from Mr. Salmon, is another sedge, collected near Wimbledon, and queried as *C. Pairæi* F. Schultz. This the Rev. E. S. Marshall, whilst unable to be certain owing to the want of mature fruit,

thinks may be true *C. muricata* L. = *C. Pairæi* F. Schultz. A small series of specimens gathered at the time for *Orchis ericetorum* Linton, which I afterwards doubted whether to refer to *O. ericetorum*, *O. latifolia*, or to a possible hybrid between these, has been seen by the Rev. E. F. Linton, who refers specimens to *O. ericetorum*, *O. latifolia*, and *O. ericetorum* × *latifolia*, and to a possible *O. incarnata* × *latifolia*. Should this latter hybrid be confirmed by the discovery of *O. incarnata* in the same locality, it will make the third known orchis-hybrid for Surrey, as *Habenaria conopsea* × *Orchis maculata* occurs in places on the North Downs. — C. E. Britton.

Perhaps I may note here that one of my earliest botanical recollections is the finding of a specimen of *Aster Tripolium* by the Thames about where the steamboat pier now stands. This was before Battersea Park was constructed—I think about 1855: I am quite sure about the identity of the plant.—James Britten.

Note on Rosa. — Major Wolley-Dod, in his account of the *Involuta* group of hybrids, makes, in rather a casual way, a most important statement which deserves a fuller notice. On page 31 he states with reference to the specimens of *R. Sabini* Woods which he had examined: "The sepals are very often reflexed, but forms of *tomentosa* frequently have them so." It is obvious that, if this statement as to these *Sabini* forms can be verified on the living bush, a very considerable step forward would be gained in enabling us to decide what is the second parent of such hybrids. Plainly, we should have to seek it amongst those forms of *tomentosa* which have their sepals reflexed. Moreover, though in my eyes this is a minor point, those forms of the hybrid with reflexed sepals could not continue to be classed under the same varietal name as those with erect sepals, seeing that their parentage would be different. Borrer, in Brit. Flora, under *Sabini* Woods, says "persistent calyx-segments erect, more or less spreading or *recurved*," but all other authors known to me state that in all such forms the sepals become erect. In the pretty considerable number of Scottish *involuta* forms which I have seen in the living state, the sepals become erect soon after flowering, but in Scotland *tomentosa* forms with reflexed sepals are rare. The Major might give some information as to the localities where the plants in question were found, so that they may be observed in the living state, as herbarium specimens are often misleading in regard to the position of the sepals.—William Barclay.

I have not been able to go fully into the question of the parentage of the various hybrids between the Sections *Pimpinellifoliæ* and *Villosæ* within the limits of my paper, which, on the whole, aims at presenting the British Roses as they now stand, rather than as they should be. It would, I believe, take some years of work in the field to elucidate these hybrids, and, as I have stated on p. 26, no two individuals of them are alike. I have not been able to separate in the herbarium those forms which involve the *pomifera* group from those derived from the groups of *Sherardi*

or *tomentosa*, but agree that at first sight it appears to be unscientific to place under one varietal name those with erect and those with reflexed sepals. This would be quite true of species, but it is quite conceivable to me that in a set of hybrids between *R. pimpinellifolia*, which has erect connivent sepals, and one of the *tomentosa* group, which has them reflexed, some of the forms might follow one parent and some the other, so that whether a varietal name be given to the whole set or not, we should have plants with the same parentage showing both directions of sepals. Mr. Barclay may have noticed that while Mr. Baker's specimen at South Kensington, labelled No. 1, from Thirsk, has erect connivent sepals, the specimen bearing the same number in Dr. Moore's herbarium has them spreading or reflexed. I do not recollect comparing the two, so that it is possible there has been some mixture, but other specimens of *R. Sabini* certainly exist, some with erect and some with reflexed sepals.—A. H. Wolley-Dod.

"New Records."—Some of the "new records" in the Rev. E. S. Marshall's interesting paper (pp. 132 seqq.) are quite ancient. For instance, *Hieracium anglicum*, *H. nitidum*, and *H. carenorum* are not only recorded by me from the same county, but from the same locality (near Aultguish); see Ann. Scott. Nat. Hist. 1903, p. 230. *H. argenteum* was recorded by Mr. Salmon in Journ. Bot. 1897, p. 348, for West Ross, for which county I also recorded *Salix aurita*, *Habenaria conopsea*, *Carex leporina*, and *Phyllitis* in Trans. Bot. Soc. Edin. in 1894.—G. Claridge Druce.

Plant Records.—*Orchis militaris* L. This plant, which the authors of the *Flora of Kent* give only on my authority based on the existence of a specimen in the Dillennian Herbarium, has recently been found in the neighbourhood of Deal by Mr. G. W. Harris, who kindly sent me a specimen, which, although not quite identical with our Oxford plant, must, I think, be referred to the above species. The labellum was much withered when I received it.—*Myosotis collina* Hoffm. var. *Mittenii* Baker, which is not given in the *Flora of Kent*, is plentiful near Littlestone-on-Sea. I also found it in Jersey, and near Petit Bo, Guernsey.—*Ranunculus flabellatus* Desv. This plant, which has been eradicated in one of its Jersey stations, and is exceedingly rare in another, was transplanted to the West Mount by Mr. J. Piquet, where it has spread considerably but does not flower. I was very pleased to find several flowerless patches on the cliffs near Fiquet Bay, which considerably extends its range. Mr. Piquet assures me he never planted it there.—*Carex tomentosa* L. Recently I took Mrs. Davy to see this plant in one of the Gloucestershire stations, and then went to see *Tulipa sylvestris* near Marston Measey, in Wilts. There she quickly detected *Carex tomentosa* in its original station, from which it has not been recently reported.—*Luzula pallescens* Besser. Mrs. Davy has been fortunate to discover this species near Pyrford, in Surrey, an interesting extension of its range. The specimens sent to me were very young, but Mr. Hunnybun agrees with me in referring them to the above species. —G. C. Druce.

REVIEW.

Common Weeds of the Farm and Garden. By HAROLD C. LONG, B.Sc. (Edin.), of the Board of Agriculture and Fisheries, in collaboration with JOHN PERCIVAL, M.A., F.L.S., Professor of Agricultural Botany, University College, Reading. 8vo, cl., pp. xviii, 451, with 106 illustrations. Price 6*s*. Smith, Elder & Co.

THERE was undoubtedly room for a book of this kind, and the position of the authors prepossesses one with the idea that they are likely to have supplied it. An examination of the pages confirms the view: the volume is thoroughly well done. It is at once popular and scientific in treatment—popular, that is to say, in the sense that people of ordinary intelligence and application will find no difficulty in understanding it and in profiting by the instruction which it gives. General consideration of weeds—what they are (with a recognition of their uses), how they affect our crops and stock, how they are spread—occupy the first three chapters; these are followed by one on preventive and remedial measures, after which the weeds of various habitats are discussed—arable and grass land, lawns and drives, and ponds, rivers and ditches: parasitic and poisonous plants have each a separate chapter, and there is a useful summary of the principles of seed testing. There is a tabulated summary of opinions as to the twelve worst weeds in various districts; Couch or Twitch (under which name are included, besides *Triticum repens*, *Arrhenatherum avenaceum* var. *bulbosum* and species of *Agrostis*) ranks first for arable land and Thistles for grass land.

The illustrations, nearly all original, are for the most part good, so that there is no difficulty in recognizing *Thlaspi arvense* in the one labelled "Field Pepperwort (*Lepidium campestre*)" (p. 65). Some of those from photographs strike us as misleading—*e. g.* that of *Equisetum arvense* (p. 228), which gives no idea of the hardness and firmness of the plant. The figures of *Callitriche* and *Hippuris* (p. 326), placed in juxtaposition, give an inaccurate notion of the relative sizes of the plants; and the same may be said of *Chrysanthemum segetum* and *Anthemis Cotula* (p. 91). "Hedge Parsley" is restricted to *Torilis nodosa*, but the name is more usually, we think, applied to *Anthriscus sylvestris*.

After a useful bibliography come five appendixes. The first, containing figures of seventy-five weed seeds, should be extremely useful: it is followed by a list of three hundred and nine "weeds" and "poisonous plants," arranged systematically under their Latin names; the third deals with the legislation regarding weeds in enforcing the destruction of noxious weeds in the chief agricultural countries of the world, and the fourth with the value of birds in destroying weed seeds. The book is, as we have said, thoroughly well done, and should be in the library of every intelligent farmer.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on June 2nd, the paper of the evening was entitled "A Contribution to our Knowledge of the Flora of Gazaland." The collections which formed the subject of the paper were made by Mr. C. F. M. Swynnerton chiefly in the high country which forms the boundary between Eastern Rhodesia and Portuguese territory. It consists of a number of detached masses of highland separated by river-valleys which ultimately unite to form the Buzi, an important river running eastwards through the lower-lying Portuguese territory to enter the Indian Ocean near Beira. Mr. Swynnerton has supplied an interesting account of the phyto-geographical character of the district. There is evidence that it was once covered with dense forest, which has, however, been largely destroyed by the annual forest fires during some former period of dense population. At present the forest occupies the more protected uplands, forming great patches: such are the great forests in the Chimanimani Mountains in the north, a rugged range reaching a height of 8000 ft., and the Chirinda and Chipete forest patches closely adjoining each other, in the south. Chirinda is described as a virgin forest of enormous and mostly evergreen trees, covering about twelve thousand acres of the higher portions of the hill. Its larger trees range from 80 to 170 ft. in height, and the undergrowth, with mosses, ferns, epiphytes, and lianas, is of a thoroughly tropical character. The collection has proved rich in novelties, especially among the gamopetalous orders of Dicotyledons, including a new genus of *Asclepiadaceæ*, *Swynnertonia*. There are also a large number of *Rubiaceæ* new to science, especially in the genera *Gardenia* and *Pavetta*; several new Senecios and Helichrysums, some new heaths, several new *Acanthaceæ*, and others. Among the *Polypetalæ* several new *Meliaceæ* are especially noticeable, also an *Anemone* from Mt. Pene, a new *Polygala*, and others. A new *Leucospermum* forms the first record from Tropical Africa for this well-known South African genus. The Monocotyledons include several new orchids in well-known African genera, such as *Eulophia* and *Angræcum*, and a number of new *Liliaceæ* and other petaloid groups. As was to be expected from the geographical position, the botany of these highlands shows a strong South African affinity, and several of the genera and a considerable number of the species have not been hitherto recorded beyond South Africa. A large proportion of the plants are identical with those previously known from Nyasaland, including the two conifers, the Milanji cedar (*Widdringtonia Whytei*) and *Podocarpus milanjianus*. There is also a well-marked Angolan element. An interesting novelty is *Pseudocalyx africanus*; *Pseudocalyx* is a Malagasy genus not hitherto known from Tropical Africa. The introduction was read by Dr. Rendle, with a review of the new Monocotyledons; Mr. E. G. Baker and Mr. S. Moore particularizing the plants which had been investigated by them.

We have received the second number of the "Occasional Magazine" of the Milford-on-Sea Record Society, which is entirely

devoted to an account of the "Wild Flowers and Seaweeds of Milford," and is printed and published by Mr. E. W. Hayter, of High Street, in that place. Milford is, we believe, in Hampshire, although we find no mention of the county anywhere in the number. The contents are various: Miss Hylda Bruce writes on "some of the wild flowers"; these include "about 30 varities (*sic*) of Vetch"—a name under which the context shows she groups all the *Leguminosæ*: a "list of wild flowering plants," which contains 406 species, follows—this ends with the *Naiadaceæ*, and is thus incomplete. Then come some "notes on the botany," by the Rev. A. H. Melvill, among which *Erythræa capitata* and *Lobelia urens*—the latter discovered by Miss Bruce near Hinton Admiral in 1907—are noteworthy. His brother, Mr. Cosmo Melvill, gives a catalogue of the marine algæ collected at Milford and Hordle, mostly in 1901 and 1903; this is the most important contribution to the number, and forms an interesting addition to the *Flora of Hampshire*.

Messrs. Dent & Co. send us a pretty book—*Summer Flowers of the High Alps*—by Mr. Somerville Hastings, already favourably known by his two little volumes on *Alpine Plants at Home*. In these as in this the illustrations are from photographs, but in the volume now before us they are from "direct colour photographs," of which thirty-nine are given. Taken as a whole they are excellent; the letterpress moreover—two pages to each plate, with a twenty-page introduction—is thoroughly well-informed and thus really useful, which is not always the case in books of this kind. Nevertheless we are by no means convinced that plants are best represented by photography. Everyone knows that portraits thus produced are sometimes exceedingly unlike the person represented, and in the same way photographs of plants, especially when coloured, may give a very false impression. In the present volume, for example, the grey-blue of *Gentiana acaulis* conveys no notion of the brilliant azure of the original; *G. brachyphylla* is rather better, but far from adequate in intensity. The habit, too, is in many instances not characteristic—e. g. *Erinus alpinus* (why is this called "Alpine Balsam"?): in others—e. g. *Aconitum Napellus*—the background produces a confused effect: there is no indication of scale, and the relative size of the plants is not ascertainable. There can, we think, be no doubt that the old way of representing flowers is not only more accurate but more artistic than the method here employed. The effect of the plates is not improved by the names in English, French, and German at the foot of each; and we find it difficult to believe that "The Spiny Fuller's Thistle," "Le Chardon le plus epineaux" (*sic*), "Stachlige Kratzdistel," are anywhere employed as vernacular equivalents for *Cirsium spinosissimum*. It remains to be said that the volume, a small quarto, is beautifully and tastefully bound.

More than two-thirds of Mr. Murdoch McNeill's interesting and careful monograph on *Colonsay, One of the Hebrides* (Douglas: Edinburgh) are devoted to the flora of the island, for besides the pages (86 to end) definitely dealing therewith, there is a chapter on

"woods, lochs and pastures," in which the vegetation characteristic of these is considered. In compiling the Flora proper, the author acknowledges help from numerous botanists, but the work is mainly a record of his own personal observations during a prolonged residence in the island. This residence has enabled him to glean from the natives first-hand information as to the Gaelic names and the uses of the plants; of the former about two hundred are given, but as to the latter, those best versed in it have gone—"had the work been attempted fifty years ago, it would doubtless have been attended with a much greater measure of success." The Flora as here enumerated, including previous records, amounts to 580 species and 70 varieties of flowering plants, ferns, and fern-allies; the number for the whole of the Western Isles is about 900. The Flora is something more than a list, as brief botanical notes on the characteristics of classes and orders are prefixed to each. It is, however, to the list that botanists will turn for comparative purposes, and in this the scientific value of the work chiefly consists.

Prof. Saccardo has published as the nineteenth volume of his monumental *Sylloge Fungorum* the first portion (A–L) of an Index Iconum, by Dr. J. B. Traverso, "enumerans eorundum figuras omnes hucusque editas ab auctoribus sive antiquis sive recentioribus." Some notion of the extent and value of the work may be gathered from the fact that this first portion contains nearly 2000 pages; it costs seventy-three francs, a price which cannot be considered exorbitant considering the amount of labour which such an undertaking involves. The work does not lend itself to an extended review; it suffices to say that it must form an indispensable adjunct to every fungological library. We note that volumes 21 and 22 of the *Sylloge*, forming parts 8 and 9 of the *Supplementum*, in which Prof. Saccardo has the assistance of Dr. A. Trotter, are announced as in an advanced state of preparation.

Mr. Fisher Unwin has published an excellent and cheap little volume (pp. 127 and map: 1s. net) on *Battersea Park as a Centre for Nature Study*, by Mr. Walter Johnson, F.G.S. Botany, of course, occupies but a small portion (pp. 67–100) of the book, but that portion is exceedingly well done; it includes notes on the wild flowers and a good descriptive list of fungi, but most of its space is devoted to the timber and other trees. There are "suggested types of rambles"—four of them botanical—with a useful bibliography and "an outline calendar." We think, however, that some of the species mentioned as having been introduced are really survivals; we remember that many years ago, while the Park was yet in process of formation, gipsywort, skullcap, a profusion of meadow saxifrage, and other "moisture-loving plants" were abundant by the ditches which have now been reduced to order and skirt the ornamental water. The book is a model of what such guides should be, and the Battersea and Wandsworth Educational Council, which is responsible for its production, is to be complimented on its enterprise.

Erratum.—For *U. glabra* (p. 68, l. 5 from bottom) read *U. scabra*.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of May Number. — The Inter-Relationships of the Bryophyta. Marchantiaceæ (Figs. 18–29), by F. Cavers. Notes on Recent Literature: "Ancient Plants," by A. C. S. "On a Little Known Type of Vascular Structure Re-described by P. Bertrand," by I. M. P. B. "Hayward's Botanist's Pocket-Book," by C. E. M.

Subscription-Price, 15*s. per annum* (*ten numbers*) *post free.*
Price of single number, 2*s.* *Price of double number*, 4*s.*

Published Monthly by the Editor, The Botany School, Cambridge.

Journal of Botany Reprints.

Bound separately in Paper Cover. Price 1s. 6d. Postage 1d.

THIRD SUPPLEMENT

TO THE

BIOGRAPHICAL INDEX OF BRITISH & IRISH BOTANISTS.

---

254 pp., Demy 8vo, Cloth extra, Price 9s. 6d. net.

BIOGRAPHICAL INDEX

OF

DECEASED BRITISH & IRISH BOTANISTS.

BY

JAMES BRITTEN, K.S.G., F.L.S., & G. S. BOULGER, F.L.S.

BOUND UP TOGETHER WITH

FIRST (1893–97) & SECOND (1898–1902) SUPPLEMENTS.

The Supplements can also be had separately, price 1/6 each; postage 1d.

Demy 8vo, 23 pp., Price 1s., Postage 1d.

INTERNATIONAL RULES

FOR

BOTANICAL NOMENCLATURE

ADOPTED BY THE INTERNATIONAL BOTANICAL CONGRESS
HELD AT VIENNA, 1905.

London · *WEST, NEWMAN & Co., 54, Hatton Garden.*

PRODROMUS FLORÆ BRITANNICÆ

PART 7 (including **Lamiaceæ, Primulaceæ, Plumbaginaceæ, Ericaceæ,** &c.). Royal 8vo. By FREDERIC N. WILLIAMS.—This new part is now ready, price 4s. 6d. by post, obtainable from the Publisher, C. STUTTER, 110, High Street, Brentford, Middlesex.

DEMY 8VO, PRICE 1S. 6D.

Key to Genera & Species of British Mosses

BY THE REV. H. G. JAMESON, M.A.

PRICE 2S. 6D., POSTAGE 2D.

The Subsection Eu-caninæ of the Genus Rosa

BY MAJOR A. H. WOLLEY-DOD.

LIMP CLOTH, 8VO. PP. 276. PRICE 6S. NET. POSTAGE 3D.

NOTES ON THE

Drawings for Sowerby's 'English Botany.'

BY F. N. A. GARRY.

PP. 32, WITH 2 PLATES, IN PAPER COVER. PRICE 2S., POSTAGE 1D.

THE BRITISH PANSIES.

BY E. DRABBLE, D.Sc., F.L.S.

PP. 24, IN PAPER COVER, PRICE 1S., POSTAGE 1D.

LINNÆUS'S FLORA ANGLICA.

DEMY 8VO, 44 PP., PRICE 1S., POSTAGE 1D.

INDEX ABECEDARIUS,

AN ALPHABETICAL INDEX TO THE FIRST EDITION OF THE 'SPECIES PLANTARUM' OF LINNÆUS.

COMPILED BY WILLIAM PHILIP HIERN, F.R.S.

London: WEST, NEWMAN & CO., 54, Hatton Garden, E.C.

Subscriptions to the Journal of Botany (16s. post free) for 1910 should be sent to West, Newman & Co.

No. 572 AUGUST, 1910 Vol. XLVIII

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

Dr. Alexander Blackwell (1709–1747). By B. Daydon Jackson, Ph.D. 193

Further Additions to the Berkshire Flora. By G. Claridge Druce, M.A., F.L.S. 195

Watson Exchange Club Report, 1908–1909 201

Short Notes.—*Tragopogon porrifolium* × *pratense* — Flintshire Plants—Note upon *Rosa*—*Kalmia glauca* Aiton — *Ceratodon conicus* in the Mersey Province—*Uva Ursi*—*Lathyrus tuberosus* L.—North Lincolnshire Plants .. 203

Reviews:—

The Subantarctic Islands of New Zealand. Edited by Chas. Chilton, M.A., D.Sc., F.L.S. 206

PAGE

The Woodlands of England. By C. E. Moss, W. M. Rankin, A. G. Tansley 209

Nature Teaching on the Blackboard. By W. P. Pycraft, F.Z.S., and Janet Harvey Kelman 211

The Aims and Methods of Nature Study: a Guide for Teachers. By John Rennie, D.Sc., F.R.S.E. 211

Eton Nature-Study and Observational Lessons. By Matthew Davenport Hill, M.A., and Wilfrid Mark Webb, F.L.S. 211

Dunkelfeldbeleuchtung und Ultramikroskopie in der Biologie und in der Medezin. By N. Gaidukov 214

Book-Notes, News, &c. 214

Supplement.—The British Roses. By Major A. H. Wolley-Dod (continued).

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had price 1s. 6d. each.

AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

2 pages	25	copies	4s.	4 pages	25	copies	5s.	8 pages	25	copies	8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

DR. ALEXANDER BLACKWELL.
(1709—1747.)

By B. Daydon Jackson, Ph.D. (Upsal), Sec. L.S.

Mrs. Elizabeth Blackwell's figures of plants, published in 1737–39 as *A Curious Herbal*, are fairly well known, as shown in Dr. Pulteney's account in his *Sketches*, ii. 251 *et seq.*, but it is certainly little suspected that additional particulars are recorded of Dr. Blackwell by no less distinguished a writer than Carl von Linné.

The reason is, doubtless, that these particulars have remained in their original Swedish dress, and have not hitherto been translated into English. The first time Blackwell is mentioned by Linné is in his *Wästgöta resa*, published in 1747, narrating the journey made during the previous year by command of the State through the province of West Gothland. On page 105 he states that Ållestad Royal Manor lay three quarters of a Swedish mile [nearly five English statute miles] from Ljung, and that Mr. Blackwell, an Englishman, who had become known through a treatise on denshiring (paring and burning), had for some years been in Sweden, and had been carrying out improvements in agriculture. Linné, and his travelling companion Liidbeck, paid a special visit, and he records his observations in the volume cited regarding crops, drainage, and management of the soil.

It is, however, the second notice by the same pen which is of special interest, and that appears in the posthumous *Anteckningar öfver Nemesis divina* [Annotations regarding Nemesis divina], which were written by Linné for his only surviving son, and were intended as solemn counsels when the father had himself passed away. Linné had, throughout his life, a strong conviction of an overruling Providence, and in these pages he gives many instances of retributive justice in the case of wrongdoers. The work was first issued, soon after its discovery, in June 1848, by Prof. E. Fries, was reprinted in his *Botaniska Utflygter*, and was finally entirely revised and enlarged by Profs. E. & T. M. Fries in 1878; it is from this edition that the following translation is made, with the editors' notes embodied. The translation follows the original as closely as possible, so as to show the simple familiar talk of the father to his son. [The name Blackwell is indifferently spelled "Blatchwell," "Blackwel," and "Blackwähl."]

"Blackwell. Jonas Alströmer requested an economist from England. Blackwel M.D. was sent, a bold, ignorant atheist.* Received as a son by Alströmer, he constantly sent Alströmer's letters with his own to England. On one occasion A. opened a letter, to find a snake in his bosom; in this Bl. stated that the whole manufacturing trade of Sweden could be strangled (*jugulari*) if Alstr. and Tessin were put to death; if the Royal Council should undergo the same fate, then with the King's co-operation an

* From this point a considerable portion of the original is in Latin.

English Prince might be chosen as heir-apparent. Alströmer was frightened, showed the letter to Tessin, and the latter to the Council of State, which uttered the desire that Bl. should be removed. At this juncture a person came to Bl. stating that he had been expressly sent by a high English personage, who had ordered him to apply to King [Oscar] Fredrik I. and offer him a considerable sum of money, if he would support the project, and that Bl. would become a powerful man, if he were able to carry the same through. The King was warned by someone of Blackwell's perilous proposition. Bl. presented himself to the King to show the letter received from England, promising the [actual] sovereignty. The King sent him to the Chancellor (*ordinum mareschallum*). He [Blackwell] was imprisoned by Löwenhielm, examined, and beheaded in Stockholm, the 29th July, 1747.

"No one knew the messenger who brought the letter to Bl. The English entirely denied that they sent anybody. When T[essin's] house was being pulled down, a corpse was found enclosed in a wall; perhaps it was he? [*i. e.* the messenger]. It is certain that from that day, neither T.'s wife nor his excellency [*serenissimus*] kept house (*fert domum*) . . . . [original incomprehensible], and I do not believe that so godless a crime could have come into the mind of the pious (*pium*) T., although such acts are a small matter to mighty men of State. And Bl. had richly deserved his fate.

"Blackwell lodged with a commission agent in Stockholm, with whose wife (though he himself had a wife in England) he lived too familiarly, travelled with her round the country, and called her cousin. He had her with him at his Royal Manor, which he had managed to obtain, for whole months. The agent became ill one evening of a colic. Blackw. as a medical man gave him something to cure him; next morning the agent lay dead. Everybody believed that Black. made away with him. At least she mourned in moderation, and fixed her hopes on Blackwell. President Drake, of the College of Commerce, who strenuously supported the manufacturers, was so treated by Black. in his illness, that he died. All said that Blackw. took the life of Drake, some guessed [hinted] by English influence."—*Nemesis*, Upsala, 1878, pp. 32–33.

The editors point out that as Alströmer was an intimate friend of Linné, the facts, at least of the early part of the above narrative, are derived from authentic sources.

There is a long account of Blackwell's protracted trial in *Frey*, Upsala, 1846, pp. 364–384; 417–441. Prof. T. M. Fries sums it up in his *Linné* as an execution on unsatisfactory evidence.

Alexander Blackwell was born at Aberdeen in 1709, son of the Principal of Marischal College, and after studying at that university till he was nineteen, went to Cambridge. In 1725 he became steward to the Duke of Chandos, and afterwards went to Leyden. After pursuing his travels through France and Portugal, he returned to Scotland, where he took his degree of M.D. Till 1742 he remained in Britain, when he was chosen by the Swedish

Minister in London as an agricultural expert, and was settled in the King's Manor of Allestad, in the län of Elfsborg, and became Court Physician. Thirst for fame and impetuosity of temper drove him into politics. It will be noticed that Linné's visit was about four years after Blackwell had settled at Allestad, and twelve months later, the curtain fell on the final act in his life's drama.

FURTHER ADDITIONS TO THE BERKSHIRE FLORA.

By G. Claridge Druce, M.A., F.L.S.

The following notes have accumulated since the publication in this Journal for 1905 (pp. 14–25). Since the publication of the Flora in 1897 about thirty-four species have been added, but the greater part of these are the critical "species" of Rubi, Hieracia, *Rosæ*, &c.

The more interesting plants included in the following list are *Prunella laciniata*, found by Mr. Weaver; *Euphorbia platyphyllos*, found by Mr. Jackson; and *Orobanche Picridis*, *Cerastium pumilum*, *C. tetrandrum*, *Zannichellia gibberosa*, and *Festuca heterophylla*, the last in a more wild-looking locality than any previously recorded; for the present, however, I put it as a denizen. My Berkshire list therefore stands:—

	Flora, 1897.	Additions.	
Native species	893	29 =	922
Denizens	45	4 =	49
Colonists	56	1 =	57
	994	34 =	1028
Casuals and Aliens ...	199	34 =	233

Two species appear to be extinct, and there are twelve of uncertain record. Two species, *Inula Helenium* and *Teucrium Scordium*, thought to be extinct, have been re-found.

Among the casuals, *Senecio viscosus* has appeared, and will doubtless extend its area. It came in 1905 with some railway ballast to Reading during the alterations to the permanent way. To that source may also be traced the enormous colony of *Œnothera Lamarckiana* along the new portion of the line between Didcot and Swindon. *Matricaria suaveolens* seems to come with poultry food, and to this source we owe *Althæa hirsuta*, *Anchusa italica*, *Echium italicum*, &c.

There still remains much work to be done in this small but interesting county, especially with the Roses and Rubi. I am always glad to hear of any new records.

Thalictrum flavum L. 4. Thatcham, *Weaver*. Fobney Meadows, *Summers*.

Anemone Pulsatilla L. 3. Abounds on the sheep down just above Streatley. Gilbert White's Diary, April 5th, 1769, is an interesting early record for this species.

†*Adonis annua* L. 4. In garden ground at Beenham, *Wallis*.

Myosurus minimus L. 2. Field near Bagley Wood, *Napier*. 4. Near Thatcham.

Ranunculus Flammula L. var. *ovatus* Pers. 2. Foxcombe Hill, *T. B. Cartwright* in Hb. Oxon.—*R. Lingua* L. Mr. Clement Reid has found seeds in Roman Silchester.—*R. sardous* Crantz. Seeds in Roman Silchester with var. *inermis*.

†*Delphinium Ajacis* L. and *†*D. Consolida* L. 2. Cothill.

Berberis vulgaris L. 2. Dry Sandford; Pusey.

Castalia alba Wood. 5. First record: "At Twiford, in ye river, grows *Nymphæa flore albo* plentifully," July 7, 1726, *Dillenius MS*.

†*Alyssum incanum* L. 3. By the railway near Reading. 5. Sonning, *Summers*.

†*Hesperis matronalis* L. 5. Near Sandford Bridge.

Sisymbrium Sophia L. and †*S. altissimum* L. 3. Near Reading, on waste ground; casual.

†*Erysimum repandum* L. 2. Cothill; casual.

Brassica Rapa L. var. *Briggsii* H. C. Wats. 1. Wytham. 2. Cothill.—*B. nigra* Koch. 2. Shrivenham, Ulffington, looking native.—*B. alba* Boiss. Seeds in Roman Silchester, *Clement Reid*.

Diplotaxis muralis DC. 2. Cothill. 3. Very abundant at Reading by the railway.—Var. *Babingtonii* (Syme). 2. Radley.

†*Lepidium perfoliatum* L. 2. Near Wallingford, *J. S. Huxley*.—†*L. Draba* L. 2. Near Oxford; Cholsey; Cothill; Steventon. 5. Near Reading, *Wallis*.

Coronopus didymus Sm. 4. Aldermaston Railway, *Dr. Willoughby Smith*.

Thlaspi arvense L. Seeds in Roman Silchester, *Clement Reid*.

Iberis amara L. 2. Hinksey, *Mrs. Lightfoot*, 1856.

†**Soria syriaca* Desv. 2. Casual, Cothill, 1808.

†*Bunias orientalis* L. 2. Between Cholsey and Moulsford.

Reseda stricta Pers. 1. Wytham Mill; alien. See Bot. Exch. Club Rep. p. 212, 1906. Still there 1910.

†**Viola hirta* L. *var. *pinetorum* Wiesb. 1. Wytham.—*Var. *inconcinna* J. Briquet. 3. Streatley.—*Var. *Foudrasi* (Jord.). 2. Cothill. 3. Streatley.—*Var. *propera* Gillot. 3. Streatley.—**V. ruralis* Jord. Boar's Hill; Pusey.—**V. variata* Jord. 2. Boar's Hill. 4. Boxford (27,694).—**V. Deseglisei* Jord. 2. Wootton, 1903. 4. Wash Common, Newbury, *A. B. Jackson* in Rep. Wats. Exch. Club, 79, 1906–7.—**V. subtilis* Jord. 3. Basildon, 1894.—**V. agrestis* Jord. 1. Cumnor. Dr. Drabble named the Pansies and Mrs. Gregory the Violets.

Dianthus deltoides L. 5. In a field near Wellington College Station, 1907, *H. P. Fitzgerald*.

†*Silene conica* L. 2. Sand-pit between Abingdon and Tubney, 1905. In 1909 Mr. J. G. Walker tells me it was quite plentiful. A casual only in Berks.—*S. anglica* L. 2. Cothill.—†**S. gallica* L. 2. Cothill; alien.

Lychnis Githago Scop. Seeds in Roman Silchester, *Clement Reid.*

Cerastium pumilum* Curtis. 2. On Blewbury Downs in 1883. In recently examining my Cerastia for critical study, I detected a single specimen of this local species among a gathering of *C. semidecandrum* collected by me in May, 1883.—C. tetrandrum* Curt. 5. To this must be referred some specimens which I gathered near Bracknell in 1896.

Sagina nodosa Fenzl. 2. St. Neot's Meadow, Radley.

Spergula arvensis L. Seeds in Roman Silchester, *Clement Reid.*

Hypericum quadrangulum L. 1. Hedges near Wytham Meadow, 1905. A rare species in the county.

†**Althæa hirsuta* L. 2. Cothill; introduced with poultry food. Doubtless to this cause its appearance in many other places is due. — †**A. rosea* L. Alien. 3. Waste ground by the railway, Reading.

Malva sylvestris L. and *M. rotundifolia* L. Seeds of both species in Roman Silchester, *Clement Reid.* — †**M. Alcea* L. 3. Waste ground near Reading railway.

†**Malope malacoides* L. 5. Near Clewer, 1902, *J. G. Everett.*

Geranium pratense L. forma *alba.* 2. Between Cumnor and Abingdon, *Mr. Murray.*

Ilex Aquifolium L. First record, "Some trees in perfect blossom on Windsor Castle, and one imperfect berry, June 1, 1798," MS. note on Sowerby drawing in Herb. Brit. Mus.

Euonymus europæus L. 2. East Garston, 1838; Grove, 1833, *Hb. Oxford.*

†*Melilotus arvensis* Wallr. 2. Cothill.—*M. alba* Desr. 2. Besilsleigh. 3 and 4. Reading. — *M. indica* All. 3. Reading railway. 4. Beenham, *Wallis.*

Trifolium pratense L. forma *alba.* 3. Hampstead Norris, *Pamplin*, 1833.—*Var. *americanum* Harz. 1. Near Wytham.—*T. scabrum* L. 2. Border of the road near Besilsleigh, 1907.

†**Vicia varia* Host. and †**V. bithynica* L. 2. Casual at Cothill, 1908.—*V. lathyroides* L. 2. Cothill, 1910.

Lathyrus sylvestris L. First record, "*L. major latifolius.* In Merley Wood plentifully," *Dillenius MS.* 1746 !—†**L. inconspicuus* L. 2. Cothill, 1908.

Rubus carpinifolius W. & N. 3. Bucklebury, *A. B. Jackson.*—*R. nitidus* W. & N. 4. Greenham, *A. B. Jackson.* — *R. rhombifolius* Weihe. 4. Greenham, *A. B. Jackson*; one large bush near the vicarage.—**R. raduloides* Rogers. 2. Boar's Hill.—**R. hirtifolius* M. & W. var. *mollissimus* Rogers. 4. Greenham Common, two spots, *A. B. Jackson*, 1908. A new record. — *R. echinatoides* Rogers. 4. Greenham Common, abundant, *A. B. Jackson.* Not infrequent in Berks.—*R. ericetorum* Lefev. 4. Hampstead Park, *A. B. Jackson.* — *R. pallidus* W. & N. 4. Snelsmore Common; Greenham Common, *A. B. Jackson.* — *R. rosaceus* W. & N. var. *infecundus* Rogers. 4. Hampstead Marshall, *A. B. Jackson.*—*R. Marshalli* F. & R. *var. *semiglaber* Rogers, but leaves untypical. 4. Greenham Common, *A. B. Jackson.*

Fragaria vesca L. var. *bercheriensis* Druce. Respecting this Count Solms Laubach wrote in 1903, "that it is without doubt very near *elatior*, and I suppose it will be a hybrid between these species and *F. vesca*, but the matter is a delicate one." Subsequently he wrote that after cultivating it some years he thought it "was a sub-montane variety of *F. vesca*, which had once been in cultivation and had since escaped from it."

†**Potentilla canescens* Bess. 5. Near Twyford, by the roadside; alien.—†*P. norvegica* L. 4. Near Reading, *A. Wallis*.

Spiræa Ulmaria L. var. *denudata* Boenn. 2. Near Ferry, Hinksey. 5. Coleman's Moor. Seeds of type in Roman Silchester.

Rosa cuspidatoides* Crépin. Tubney. 2. Cothill; Moulsford.—R. uncinata* (Lees). 2. Boar's Hill; Cumnor.—*R. stylosa* Desv. 1. In a hedge near Wytham Meadows, 1905.

Cotyledon Umbilicus L. 4. Donnington Castle, *F. Comyns*.

†*Ammi majus* L. 2. Letcombe Castle, *Riddelsdell*.

†**Sedum Cepæa* L. 3. Bradfield, *J. H. Vince*, 1900; alien.

Epilobium angustifolium L. 2. A patch established itself on the railway between Oxford and Kennington in 1907. 3. Near Reading, on railway, 1907.

†*Œnothera biennis* L. sens. lat. 2. Most abundant along the railway from Didcot to Shrivenham, 1908; *Lamarckiana* DC.

Bupleurum rotundifolium L. 1. Wytham Mill. 2. Cothill. 3. Reading railway.

†*Caucalis latifolia* L. 2. Cothill. 4. Emborne Road, *A. B. Jackson*.

†*Lonicera Caprifolium* L. 2. In a hedge between Pusey and Cherbury Camp.

Valerianella dentata Poll. Seeds in Roman Silchester, *Clement Reid*.

†**Galium Vaillantii* Lois. 2. Cothill. 3. Near Reading, *A. B. Jackson*, 1907. Casual only.

Dipsacus pilosus L. 1. Wytham. 5. Holme Park, Sonning, *Summers*.

Bellis perennis L. 3. A fasciated form with six heads on one stem, Yattendon, 1906, *A. Simeon*.

**Senecio viscosus* L. Abundant on railway ballast, Reading; a new record, see Rep. of Exch. Club, p. 229, 1906. In 1907 it had spread to the embankment.

Filago apiculata G. E. Sm. 2. Cothill; native.

Pulicaria prostrata Asch. 5. Shinfield, Sept. 29, 1830, *Herb. Salt* at Sheffield.

†*Ambrosia artemisiæfolia* Willd. 5. Maidenhead, *Summers*.

†*Inula Helenium* L. 2. Near Shrivenham, on the railway.

†*Anthemis tinctoria* L. 2. Boar's Hill.

†*Mariana lactea* Hill. 2. Still in the locality near Abingdon where it was noticed by Baxter in 1827; Besilsleigh, *Miss Walker*.

†*Crepis setosa* Hall. f. 2. Abingdon, *F. Stone*, 1905.—†*C. nicæensis* Balb. 3. Reading, ballast.—*C. biennis* L. 2. Shrivenham.

†**Hieracium aurantiacum* L. 3. Gravelly field near Bradfield

College, 1908, *J. H. Vince.*—*H. maculatum* Sm. 5. Near Early.—*H. lepistoides* K. Johanns. (*H. pellucidum*). 2. Still plentiful at Upton.—**H. cacuminatum* Dahlst. 5. Sandhurst. New record.—*H. sciaphilum* *var. *transiens* Ley. 3. Near Reading, &c.—*H. boreale* Fr. *var. *Hervieri* Arv. Touv. 2. Boar's Hill. 4. Emborne Street.

**Sonchus palustris* L. Seeds in Roman Silchester, *Clement Reid.* Probably introduced from adjacent marshes with the reeds used for thatching the roofs of houses. Long ago extinct in the district, but the extensive reed-beds of the Kennet may still hide it.

†*Campanula latifolia* L. 5. Whyte Knights, near Reading, *I. Carroll* in Herb. Brit. Mus., but probably a garden specimen.

Anagallis arvensis L. 2. "Pimpernell with an elegant white flower; I found it in a field by South Hinksey, two miles from Oxford," *M. Dodsworth* in Herb. Sloane, vol. 27, fol. 103; see Journ. Bot. p. 101, 1909.—*A. tenella* Lightf. 2. First record, "Prope Chilswell," *Dillenius MS.* 1746.—*A. femina* Mill. 2. The plate, t. 169, in Hook. Fl. Lond. was drawn from a specimen gathered "in Wooten fields by Mr. Bicheno."

Centaurium umbellatum Gilib. 1. First record, "About Wytham," *Dillenius MS.* 1746.

†*Anchusa officinalis* L. 2. Boar's Hill, *E. D. Watkin*, New Coll., Cothill, 1907, 1908.—†**A. italica* Retz. 2. Cothill; alien.—†**A. ochroleuca* M. Bieb. 2. Cothill; alien.

†**Echium italicum* L. 2. Cothill, 1907, 1908, 1909; see Rep. Bot. Exch. Club, 1907, 303.

Myosotis collina Hoffm. * var. *Mittenii* Baker. 2. Kingston Bagpuze.

Cuscuta europæa L. 4. In a lane leading from Greenham Common to Chamberhouse, Newbury, *Bicheno* in Hook. Fl. Lond. vol. iii. t. 67.

†*Verbascum Blattaria* L. 5. Park Place, *Mr. Stanton*, 1904.

Linaria Cymbalaria Mill. 5. "I know it to have been planted on Windsor Castle by Sir Joseph Banks and Dr. Lind," *Sowerby's MS.* on drawing in Herb. Brit. Mus.

Scrophularia vernalis L. 3. The plate, t. 70, in Hook. Fl. Lond. is from a specimen "from a lane leading from Bucklebury Church to Marsden, 1817," *Mr. Bicheno.*—*S. nodosa* L. var. *Bobartii* Pryor. 2. Near Radley, *M. Odling.*

Veronica agrestis L. 2. First record, "Fields near Wallingford," *E. F. Witts*, 1836.

Melampyrum pratense L. var. *latifolium* Schueb. & Mart. 3. Bere Estate.

Limosella aquatica L. 4. By the Emborne on Wash Common, *A. B. Jackson*, 1906. Still on Binsey Common, Oxford, 1909.

**Euphrasia curta* Fries. 2. Blewbury Downs.

**Orobanche Picridis* F. Schultz. 3. Near Streatley, growing on *Crepis capillaris*; the name confirmed by Dr. Beck. A new county record.

Mentha rubra Huds. 4. Near Newbury, *Bicheno.* 3. Near Tilehurst, 1906. 3. Moulsford Downs, *Miss Neild*, 1909.

Salvia pratensis L. 4. In a field laid down to grass for many years at Weston in 1905, *Mr. Osmond*. — †*S. verticillata* L. 2. Cothill.

Nepeta hederacea Trev. 1. First record, "Calamintha humilior, folio rotundiore Tourn. flore eleganti, dilute purpureo, labio inferiori macula saturanter purpureo picto, qualis hic Oxonii ad trajectum Ensham Ferry dicto subter salices nascitur," *Dillenius MS.* 1746.

**Prunella laciniata* L. 3. Tilehurst, first found by *Mr. Weaver*, 1903; see Journ. Bot. 1906, p. 365, and Rep. of Exch. Club, p. 199, 1906.

Galeopsis speciosa Mill. 4. Banks of Lamborne River about half-way between Shaw and Ham Mills, *F. Comyns*, 1905.

†*Kochia scoparia* Schrad. 3. Reading on railway ballast, see Rep. Exch. Club, p. 241, 1906.

Viscum album L. 5. The favourite trees in Windsor Park for the misletoe are the lime, the poplar, the thorn, and the maple, *W. Menzies*, Windsor Park, 1864. On poplars near Bagshot.

Chenopodium Bonus-Henricus L. Seeds in Roman Silchester, *Clement Reid*.

†*Euphorbia Esula* L. *var. *pseudocyparissias* (Jord.). 4. Near Welford, 1904. — †*Var. *lutescens* Huth. 2. Near Marcham, 1907. — **E. platyphyllos* L. 4. In a wheat-field near Hampstead Marshall, *A. B. Jackson*, 1906; the first certain record for the county.

Betula alba L. 2. First record, under the birch trees in Childswell Copse, *J. Bobart MS.*, about 1697.

†**Populus deltoides* Marsh. Frequent in all the districts; the *P. nigra* of *Flora Berkshire* for the greater part. New in name only.

Helleborine media *var. *platyphylla* Druce. 5. Bisham Wood.

Ophrys apifera Huds. 2. Kennington. — *O. muscifera* Huds. 2. White Horse, *F. Stone*.

Galanthus nivalis L. 2. Kingston; alien doubtless. Perhaps native in 1, Wytham.

Leucojum æstivum L. 3. By the Pang near Bradfield, *Rev. E. Peake*.

†*Muscari comosum* Mill. 2. In a plantation at Besilsleigh; perhaps introduced with young conifers, *Mr. H. Fisher*, 1907.

Tulipa sylvestris L. 2. Kingston Bagpuze, 1907, *J. C. Mather*.

Colchicum autumnale L. 3. Yattendon, *Miss Moore*.

†*Scilla hispanica* Mill. 2. Cothill in two localities.

Neottia Nidus-avis Rich. 5. Copse near Aldermaston Soke, *W. H. Summers*.

**Zannichellia gibberosa* Reichb. 2. Brackish ditches at Marcham, 1891. The *Z. pedunculata* of the Fl. Berks., either in part or wholly.

**Carex lepidocarpa* Tausch. 5. Early, &c. — *C. leporina* L. *var. *argyrolochin* Lang. 5. Bulmershe Park, *C. E. Salmon* in Journ. Bot. 1906, 225. Reduced to a form by Kükenthal in the *Pflanzenreich*.

Potamogeton Drucei Fryer, Mon. Brit. Pondweeds, p. 31, t. 21. Loddon, No. 4593, *Herb. Normale Dörfler*, Aug. 1904.

†**Panicum colonum* L. 3. Reading, on railway ballast, 1906, with *P. glabrum* Gaud., *P. Crus-galli* L., *Setaria viridis* Beauv., *S. glauca* Beauv., and *S. verticillata* Beauv., all aliens.

Arrhenatherum elatius M. & K. *var. *biaristatum* Druce. 1. Wytham.

**Kœleria britannica* Domin. 2. Besilsleigh. 3. Streatley, &c.

Melica uniflora Retz. 2. Besilsleigh.

**Festuca heterophylla* Lam. 3. In Billingbere Wood, and under trees by the roadside on the Bere Estate about a mile and a half from Bradfield; see Rep. of Exchange Club, p. 322, 1907. It has the appearance of a native species in this locality, being very plentiful and with no introduced shrubs.—*F. arundinacea* Schreb. 2. On Kimmeridge Clay, Boar's Hill.—*F. ovina* L. †*var. *glauca* Koch. 4. Reading, Coley Avenue, *Dr. Stansfield*; not native.

**Bromus leptostachys* Pers. 3. Near Pangbourn; a variety of *B. hordeaceus* L. — †*B. unioloides* Schrad. 3. On railway ballast at Reading.

Lolium perenne × *multiflorum*. 1. Wytham; with Dr. Domin, who showed it me.

Phyllitis Scolopendrium Greene. 4. Wire Mills, *Dr. Stansfield*; Welford.

Polypodium vulgare L. 5. "P. bifurcata pinnulis serratis on ye walls of Windsor Castle," *Adam Buddle's Herb.* in Herb. Brit. Mus.

WATSON EXCHANGE CLUB REPORT, 1908–1909.

[The following are among the more interesting of the notes published in the last Report of the Club; for the numerous notes on *Rosa*, *Rubus*, *Hieracium*, and other critical genera, reference must be made to the Report itself. We are glad to see the warning conveyed in the concluding sentence of the paragraph prefixed by the distributor, Mr. A. B. Jackson, to the Report:—"One or two members, however, erred in the opposite direction and collected several rare plants in too large a quantity. It must be remembered that the Club does not exist for the extinction of rarities, and their attention is called to the remark at the commencement of the list of desiderata, that in gathering plants they are to take care they run no risk of destroying or appreciably diminishing a plant in any locality."—Ed. Journ. Bot.]

Barbarea arcuata Reichb. Origin, side of drain-ditch, Upton-on-Severn, Worcs., v.-c. 37. Cult. Ledbury, June 14, and Aug. 13, 1907.—S. H. Bickham. Beautiful specimens of this plant, which is doubtless the *B. arcuata* of many English and Continental botanists, but it differs from the *B. arcuata* of Reichenbach (Icones Fl. Germ. ii. fig. 4356) in a character on which Syme (E. B. ed. iii. vol. i. 173) lays great stress, namely, in the seed being broad and short. In Reichenbach's type, which

I have also examined, the seed is long and narrow, *i. e.* more than twice as long as broad. This Upton plant is what in *Flora of Berkshire*, p. 44, I have called *B. vulgaris* var. *decipiens* (= *B. lyrata* Aschers. var. *decipiens*), but if anything the flowers are a trifle larger, my plant being near to, if not identical with, the plant wrongly figured by Reichenbach in Sturm's *Deutschland Flora* as *arcuata*, and this may be the origin of the confusion respecting it by Continental authors.—G. Claridge Druce. The seeds of this plant, though they vary somewhat, approach so closely to the character of those in Reichenbach's Icon. n. 4357 in Iconogr. Cent. xi. pt. 2, that, taking other marks into consideration, there need be no doubt at all that Mr. Bickham's specimens are good examples of the true *B. arcuata* Reichb.—J. R. Drummond and A. B. Jackson.

Medicago lupulina L. var. scabra Gray. With the typical form on limestone at Waterhouses, Staffs., v.-c. 39, June 22, 1908. —T. E. Routh and A. B. Jackson. Correct, I believe. The description of the habitat seems to indicate that it is native here, which is interesting (see Mr. Beeby's note in Journ. Bot. 1895, p. 315). I have been unable to see a full description of Gray's variety, but I am concluding it is identical with Koch's *Willdenowiana*, and not merely a diagnosis of the hairy-fruited state of *lupulina*.—C. E. Salmon.

Saxifraga Geum × serratifolia. Origin, rocks at head of Slaheny Valley, near Kilgarvan, S. Kerry, Ireland, 1903 (E. S. Marshall). Cult. Underdown, Ledbury, June 5, 1908.—S. H. Bickham. If *serratifolia* were one of the parents, a more oblong leaf, less truncate at the base, would occur on this plant. I think it probably is a hybrid, but with these round leaves, very few of them at all longer than broad, I should prefer to regard the plant as *S. Geum dentata* × *S. umbrosa punctata*. It differs but slightly from the specimens of *S. hirsuta* from the same original locality, and it is a question whether *S. hirsuta* (a somewhat unstable species) does not originate from *S. umbrosa* and *S. Geum* forms crossing.—E. F. Linton.

Callitriche intermedia Hoffm. (ref. no. 3252). Loanan River, near its outflow into Loch Assynt, Inchnadamph, W. Sutherland, v.-c. 108, July 18, 1908. A particularly fine growth of a narrow-leaved form, frequent in Highland lochs and streams. It may deserve a special name, but I do not know of any such existing for it.—E. S. Marshall.

C. intermedia Hoffm. Fl. Germ. (1791) i. p. 2.
C. hamulata Kütz. var. *tenuifolia* Lönnroth, Obs. Crit. Pl. Suec. Ill. (1854), p. 21.
= *C. tenuifolia* Persoon, Syn. Plant. (1805).
= *C. autumnalis* var. *Goldbachii* Kutz., in *Linnæa*, vii. (1832).

To this seems to belong the *C. hamulata β homoiophylla* Gren. & Godr. Fl. Fr. (1848), i. p. 591 = *C. angustifolia* Hoppe ex Koch, Syn. Fl. Germ. et Helv. ed. 1, i. (1837). This occurs in Sweden, in Scanica (Fries, Fl. Scanica), Smoland (or Smaland), Halland, Bohuslän, and Södermanland. Mr. G. West (Proc. Roy. Soc.

Edinb. xxv. p. 973 (1905)) describes this as "extremely abundant in almost every loch in the Loch Ness area; a dominant plant." I have the same form from Scalloway, Shetland (R. M. Barrington); the Isle of Tiree, v.-c. 103 (S. M. Macvicar). The only southern specimen I have seen like it is one from Earlswood Common, Surrey, 1870.—A. Bennett.

Tragopogon pratense L. Scraptoft, Leices., v.-c. 55, June 22, 1905. According to the *Flora of Leicestershire* (1886), p. 98, *Tragopogon pratense* L., type, is not found in Leics., only the var. *minus* (now recognised as a species) being noticed at that time. The type, therefore, is a new record for v.-c. 55. These specimens were gathered in an upland meadow laid to grass, in association with *Botrychium Lunaria*, *Spiræa Filipendula*, &c. It was first pointed out by the Rev. H. P. Reader, and has since been noticed at other localities in the county; so that the var. *minus* cannot be said to be the dominant form, as supposed.—A. R. Horwood. In the only open flower on my two plants the florets considerably exceed the phyllaries; this would appear to make it var. *Symei* Ar. Benn. (*T. pratensis* var. *grandiflorus* Syme).—E. S. Marshall.

Colchicum autumnale L., white-flowered variety. Growing with the purple-flowered form on heavy soil about Bredfield, near Woodbridge, E. Suffolk, v.-c. 25, Sept. 7, 1908.—F. L. Foord-Kelcey. This corresponds better with *C. candidum* Schott and Kotschy (see Baker in Journ. Linn. Soc. xvii. p. 429) than with typical *C. autumnale* L. Baker has reduced *C. candidum* to *C. lætum* Steven, in Mem. Mosc. vii. 66, t. 13, but this seems doubtfully correct. Whether *C. candidum* may not be conspecific with *C. autumnale* we do not pretend to decide, but Mrs. Kelcey's plant is no doubt the *C. anglicum album* of Parkinson's *Paradisus* (1646), p. 153. The white-flowered meadow-saffron would seem to have been, if anything, better known in Parkinson's time than the purple. Both have, in all probability, been originally introduced, but have since become established in Britain.—J. R. Drummond and A. B. Jackson.

SHORT NOTES.

Tragopogon porrifolium × pratense.—Last year one of us (W. A. Todd) found *T. porrifolium* L. growing in quantity among grass on enclosed land between Putney and Barnes, Surrey, and this year noticed there plants of a *Tragopogon* with flowers of a peculiar hue, that suggested the likelihood of these plants being the product of *T. porrifolium* crossed with *T. pratense* L. The latter species was likewise present in abundance, the form being that we know as *T. pratense* proper. A careful examination and comparison of the three forms has convinced us that the opinion formed by the finder concerning the dull purple-flowered plant is correct, and that we have here a hybrid-form not hitherto noticed in this country. Our plant is distinguished principally by the colour of the flowers, of a dull cloudy purple, with an under-

lying yellowish tint. At the base of each ligule the yellow colour is fully developed and the subdued yellowish colour appears strongly along the veins and at the extremities of the ligules. In such characters as the extent to which the leaf-base is developed, and the extent to which the extremity of the peduncle is inflated, our plant is fairly intermediate between the parent species. We have noticed that the pappus-bristles of *T. porrifolium* and *T. pratense* display differences not alluded to in descriptions given of these species in the floras, and in this respect our hybrid plant is nearer *T. pratense*. This hybrid is of particular interest, as, according to Focke (*Die Pflanzen-Mischlinge*), it was the first plant-hybrid to be intentionally produced for scientific purposes, and, that, by Linnæus. From seed produced by the pollination of *T. pratense* by *T. porrifolium*, Linnæus obtained plants which in the summer of 1759 bloomed with red flowers yellow at the base. Single specimens of the wild hybrid have, according to J. Lange, been observed on the Danish islands of Laaland and Fünen, growing among the parent species, and characterised by the outer florets being brown-violet in colour, the inner yellow. As Focke gives no other localities, we conclude that this hybrid is of rare occurrence. There were numerous plants of it at the Surrey locality this season, and it appears to be fertile to an extent.—C. E. Britton; W. A. Todd.

Flintshire Plants (p. 184).—Mr. Moyle Rogers remarks on the omission of *Cerastium tetrandrum* and *C. semidecandrum* from my papers on the Flintshire Flora, and incidentally suggests that I may have overlooked or failed to recognize these plants. Mr. Rogers had already recorded *C. tetrandrum* for Flintshire (*Journal of Botany*, 1891, 120) and it seemed unnecessary to repeat the record. I first observed both the plants in question in several places on the Flintshire coast some years ago, before I was acquainted with Mr. Rogers's record. I also encountered them recently on the sandhills between Prestatyn and Rhyl. *Hypochæris glabra* which Mr. Rogers also mentioned last month was published by him in the same place. In my various papers on the Flintshire Flora, I have only included a small fraction of the results obtained; and a full account of these will appear in the Flora of Flint and Denbigh which I have in preparation. I shall be glad to receive any notes or records dealing in any way with the vegetation of either of these counties and of Denbigh in particular. Mr. Rogers errs in recording the Cloudberry for Flintshire: this species does not occur in the county. The mistake is excusable in one possessing little practical knowledge of the topography of the county, the more so as Professor Babington locates the peak in Flintshire; as a result this record has been accepted by several later compilers, and quoted without any attempt at verification. Cader Fronwyn, or more correctly Fronwen, is situated in that part of Denbighshire which lies south of the Dee, and about five miles west of Llanarmon Dyffryn Ceiriog; it is partly in Merioneth and partly in Denbigh, as the county boundary passes over it. Whixall Moss, which Mr. Rogers mentions in connection with

Rubus fissus, is in Shropshire. The adjoining isolated and anomalous portion of Flintshire must also be regarded as a part of Salop for all biological purposes.—A. A. Dallman.

Note upon Rosa.—In writing the note which appears on p. 187, it was not my purpose to criticize Major Wolley-Dod's statement, or to enter upon any discussion regarding it, but merely to call attention to its importance and to induce botanists who take an interest in *Rosa* to ascertain by observation of the living plants whether or not a certain number of those forms hitherto named *R. Sabini* really have their sepals reflexed. I have no doubt that the Major has accurately described what he saw in the herbarium specimens, but herbarium specimens, especially when gathered in immature fruit, are often deceptive with regard to the point in question, and I should have thought that he would have been equally desirous with myself to have the matter settled by observation of the living plants. It was to render this more easy that I suggested his giving a list of the localities in which the herbarium specimens referred to were gathered, and I may add that the date of collecting and the collector's name should also be given. The fact that in so many of these *Sabini* forms nearly all the fruits abort and drop off before they have to any extent developed makes it more difficult than one would imagine to ascertain the real position of the sepals when the fruit is mature. I hope the Major will see his way to adopt my suggestion, and that others who may have the opportunity will give attention to the settling of this very important point.—W. Barclay.

Kalmia glauca Aiton.—When penetrating a very wet bog in Mid Surrey for the purpose of securing orchises growing there, I noticed many bushes of a low-growing shrub that was quite unfamiliar to me. Unfortunately, the plants were past flower and fruiting abundantly at this date (June), and also showed remains of the infructescence of several previous seasons. This plant has since been identified for me at the Natural History Museum, South Kensington, as *Kalmia glauca* Ait. It is a widely spread and well-known North American shrub. I have been in communication with the lord of the manor where it grows, but have failed to obtain any information as to it being sown or planted. There are no gardens in the vicinity.—C. E. Britton.

Ceratodon conicus in the Mersey Province.—In March last I gathered on the sandhills at Formby, on the Lancashire coast, sterile specimens of a *Ceratodon* which aroused my interest. Subsequently, early in May, I found similar plants in fruit farther along the coast at Freshfield (v.-c. 59). I submitted the Freshfield gatherings to Mr. H. N. Dixon, and he reported that they must be referred to *Ceratodon conicus*, as, although the leaf-characters were not so well marked as in some forms, *e. g.* in the plant which grows on the tops of mud-walls in Northamptonshire, the capsule was very typical. He also informed me that *C. conicus* is described as being common in hollows of the dunes at Dunkirk

on the French coast, where it grows along with *Bryum pendulum*, *B. Warneum*, &c., exactly as is the case in the Lancashire sand-dunes. On searching through Mr. J. A. Wheldon's herbarium, it was found that Mr. Wheldon had specimens labelled *C. conicus ?*, collected by him some years previously on the South Lancashire coast, but in these specimens the fruit was not in proper condition for critical examination. We also found a specimen from the sandhills at New Brighton, Cheshire, v.-c. 58, *leg.* J. A. Wheldon, April 9, 1892, which we also refer to *C. conicus*. This plant has not the well-marked comal tuft of leaves, nor the nerve so excurrent as in the Freshfield specimens, but the fruit is quite typical of *C. conicus*.—W. G. Travis.

Uva Ursi (p. 183).—The proposed use of *Uva Ursi* for *Arctostaphylos* is excluded by analogy: Linnæus (Phil. Bot. 160 (1751)) says:—"Nomina generica ex duobus vocabulis integris ac distinctis facta, e Republica Botanica releganda sunt . . . [e.g.] Vitis idæa T. *Vaccinium*."—B. D. Jackson.

Lathyrus tuberosus L.—Referring to Mr. Christy's article on p. 170, I discovered this plant last year by the side of the canal at Lydney, where many aliens and many interesting native plants grow intermingled. It was not then in flower; but I dug up a root, and cultivation in Mr. Bull's garden at Chepstow showed it to be *L. tuberosus*, as I suspected.—H. J. Riddelsdell.

North Lincolnshire Plants.—After being hunted for over fifty years *Cardamine amara* L. was discovered on May 26th on freshwater alluvium close to Aylesly Bog, at the first meeting of the Lincolnshire Union. The following species have been omitted from my *Check-List of Lincolnshire Plants*:—*Cochlearia Armoracia* L., 1865, Britten — 1, 4, 5, 7, 8. *Viola arvensis* Murr., 1851, Watson + all. *Nymphoides peltatum* Rendle & Britten, 1895, Craster + 13, 15.—E. Adrian Woodruffe-Peacock.

REVIEWS.

The Subantarctic Islands of New Zealand. Reports on the Geo-Physics, Geology, Zoology, and Botany of the Islands lying to the south of New Zealand, based mainly on Observations and Collections made during an Expedition in the Government Steamer 'Hinemoa' (Captain J. Bollons) in November, 1907. Edited by Chas. Chilton, M.A., D.Sc., F.L.S., Professor of Biology, Canterbury College, University of New Zealand. Published by the Philosophical Institute of Canterbury, N.Z. Two volumes, demy 4to. Vol. i. pp. xxxv, 1–388; vol. ii. pp. 389–848. Numerous plates and figures in text, and large map. Dulau & Co., London. Issued 22 Dec. 1909.

The contents of these handsome volumes are sufficiently indicated by the title, which we quote in full. It is with the second

volume that we are principally concerned, although one of the most interesting of the chapters—that on the ecological botany of the islands, by Dr. Cockayne—is to be found in the first. In the second we have chapters on the systematic botany of the islands to the south of New Zealand, by Mr. T. F. Cheeseman; on the chief plant formations and associations of Campbell Island, by Mr. R. M. Laing; on the *Gramina* of the Subantarctic Islands, by Dr. Petrie; and on the Marine *Algæ*, by Mr. Laing; with a list of Cryptogams (excluding *Algæ* and *Pteridophytæ*) collected by members of the Expedition, identified by G. Massee, Prof. G. Lindau, F. Stephani, and Dr. Brotherus.

Mr. Cheeseman prefaces his account with a short history of the botanical exploration of the islands, which dates from 1840, in which year it was visited by three important scientific expeditions—the United States Exploring Expedition, under Commodore Wilkes; the French Expedition, led by Admiral D'Urville; and the Antarctic Expedition of Sir James Clark Ross, of which Sir Joseph Hooker, who was attached to it as naturalist, has given so important and valuable an account in the *Flora Antarctica*. Some of the collections here utilized were studied by Mr. Cheeseman when preparing his admirable *Manual of the New Zealand Flora*; a few of the conclusions therein arrived at have been modified in the present volume—*e. g.* the variety of *Myosotis capitata* named *albiflora* is now raised to specific rank as *M. albida*, and *Astelia linearis* var. *subulata* Hook. f. becomes *A. subulata* Cheesem. Two or three new combinations are necessitated by the Vienna Rules; but Mr. Cheeseman wisely refrains from any attempt to correct or modify generally accepted nomenclature except in cases where this is absolutely necessary. A list of twenty-two naturalized plants—all, except *Phormium tenax*, common European species—is given; and the chapter concludes with a tabular view of the distribution of the phanerogams, ferns, and lycopods found in the islands, followed by notes on the affinities of the flora, with suggestions as to its previous history. Mr. Cheeseman enters into interesting details as to the component parts of the flora, which he concludes "is in its main characters and alliances nothing more than a branch of the New Zealand flora, to some extent changed and modified by long ages of isolation." The grasses form a separate chapter by Dr. Petrie, who describes four new species—*Poa Tennantiana*, *P. antipoda*, *P. aucklandica*, and *Atropis antipoda*. Mr. R. M. Laing, with the assistance of Mr. Gepp, has enumerated the Marine Algæ, which are illustrated by four plates and numerous critical remarks; of the other cryptogams merely names and localities are given.

Dr. Cockayne's account of the "ecological botany" of the islands is an interesting and valuable contribution, to which Mr. Laing's article on the chief plant formations and associations of Campbell Island furnishes additional information. Both are admirably illustrated by blocks from photographs; the series illustrating the growth of the species of *Pleurophyllum* is remarkably good. The influence of animals on the vegetation is very

marked; the larger herbaceous plants of Campbell Island are especially attacked by the sheep, through whose agency *Ligusticum latifolium*, of which they are very fond, is becoming restricted to the faces of rocky cliffs and other inaccessible places; the more common tussock grass (*Poa litorosa*) is also being eaten out by them. "There are now some eight thousand sheep on Campbell Island, and at least two-thirds of its surface is open to them, so that the transformation and destruction of the native vegetation is going on at an increased rate of speed, and soon the only portions of the island left in a virgin condition will be the parts occupied by remnants of the scrub which sheep cannot penetrate, the tops of rocky hills, and the faces of cliffs." On the Bounty Islands there is no visible plant-life, these "being packed in the breeding season with millions of penguins and large numbers of mollyhawks." On the Snares, the "rookeries" of the penguins destroy visible plant-life; but when these are abandoned, plant-colonization speedily sets in, beginning with *Crassula moschata*, and in course of time there is once more a meadow. "If the enormous number of penguins be taken into consideration, there can be little doubt that through their agency the plant-covering of the Snares has been destroyed again and again, always to quickly reinstate itself. Even the forest can have no chance of renewal when the old trees die, so long as the birds are present." Of the renewal of vegetation on Disappointment Island, after it has been killed out by nesting mollyhawks, the following account is given:—

"The first plant to appear is *Acæna Sanguisorbæ* var. *antarctica*, which forms sheets over the ground and gives the distinguishing green colour. Then there will soon be abundance of a species of Gentian, its spreading stems making a glossy dark-green mat. Here and there will be small plants of the dark-green *Blechnum durum*, small straggling *Veronica Benthami*, small mats of bright but rather pale-green *Epilobium confertifolium*, a few dark-green plants of *Polystichum vestitum*, and, growing through the mats of *Acæna*, a little *Bulbinella Rossii*, and perhaps some *Stilbocarpa polaris* here and there. But easily dominant, and at a distance the sole plant apparently, is the *Acæna*. Ultimately, such a piece of regenerated vegetation as described above, and which represents quite a late stage, will be in process of occupation by tussocks of *Poa litorosa*, which it is easy to see will, as they grow up, destroy, or at any rate thin out, the present plants; but the *Acæna* will finally, liane-like, in many cases climb over the tussock, gain the light, and preserve itself from destruction."

It will be seen from what has been said that both the systematist and the ecologist will find in these volumes much matter of interest. A word must be said in praise of the general get-up, which is excellent. The paging of the work is continuous; the full index to both is given with each volume, with a useful reminder at the head of each as to where the second volume begins.

The Woodlands of England. By C. E. Moss, W. M. Rankin, and A. G. Tansley. (A pamphlet of 36 pages, reprinted from *The New Phytologist*, vol. ix. Nos. 3 and 4.)

The joint authors are to be congratulated on their brochure. It is a very good introduction to a much neglected subject; and such notebook sketches, when carefully edited, are invaluable for other students.

Agreeing fully with the analysis of types of woods given both in the text and the tabulated scheme, I cannot do better than reprint the summary:—

I.—Alder-Willow Series: on very wet soils; consisting of at least two distinct associations, as yet insufficiently studied to allow of satisfactory separation and characterization.

II.—Oak and Birch Series: on non-calcareous soils.

(A.) Oakwood associations: on non-peaty soils at low and moderate elevations.

(a.) *Damp Oakwoods*: on clays, shales, loams, fine sands and moist soils generally.

[Derived artificial type: Oak-hazel copse.]

Oak-ash-birchwoods: on shallow well-drained soils in a wet climate.

(b.) *Dry Oakwoods*: on sandstones, grits, sands and dry soils generally.

(B.) Oak-birch-heath association: on dry coarse sandy and dry peaty soils (low elevations).

(C.) Birchwood association: on non-calcareous soils at high elevations (from 1000 feet to the upper wood limit on the Pennines).

III.—Beech and Ash Series: on calcareous soils.

(A.) Ash-oakwood association: on calcareous clays, marls, impure limestones, and calcareous sandstones.

[Derived artificial type: (Ash-) Oak-hazel copse.]

(B.) Ashwood association: on limestones.

Ash-birchwood: on limestones at high elevations (from 1000 feet to the upper limit of woodland).

(C.) Beechwood association: on Chalk in the south-east of England, with a western extension on the Oolites of the Cotswold Hills.

We have first a very clear account of "the status of British woodlands," which admirably summarizes the facts. It is open to one criticism: How can fully grown plantations on the sites of former old if not ancient woods be distinguished from truly ancient growths? I mean where the original hedges or fences have given protection to the characteristic under-flora, which in twenty-five years spreads throughout and takes possession of a new plantation. I have such a spinney in my memory now—a half-acre in the corner of a field, which I saw planted myself in 1867. An oak-woodland had been on the site, but for a hundred and fifty

years the soil had been cultivated. Its flora now and for many years has contained *Scilla*, *Adoxa*, *Primula*, *Lychnis*, and *Allium oleraceum*, all obtained from the old hedge of the former wood. Birds have sown *Pyrus pinnatifida* and *Daphne Laureola* from the Manor garden not far off. In eighty years' time, what would the most knowing of botanists make of it? For within four hundred and fifty yards is a true fragment of ancient woodland, if such a thing actually exists in England.

Recording *Allium oleraceum* as a woodland species may cause some difficulty. There are, however, two varieties of this species—*A. oleraceum*, *genuinum* of Syme is found rarely in Lincolnshire in dry, sandy fields, more commonly on estuarine alluvium in strong-growing herbage or under the shelter of hedges or banks. The variety *complanatum*, with its wider and flatter leaves, requires more shelter and is found on the outskirts of woods, bushy ground, hedges, &c., by old woodlands in Lincolnshire. *A. ursinum* is not found in the wood I refer to, though it occurs less than a hundred yards away.

The definitions "fringing carrs" and "fen carrs" is unfortunate. The original meaning of "carr" is a lowland level stretch of peat. In many cases now the name "carr" still remains, but their soil is pure clay or sand, the peat covering having departed over thousands of acres. Surely, too, the so-called "fringing carrs" are the spots where the alluvial soil and limy waters acting together have prevented peat growth in excess.

Ash is also recorded as abundant in "the alder-willow thickets." I ask, for I want to know, do either ash or alder grow on anything but the very shallowest peat? The first will grow on thin peat, taprooting into clay or alluvium. Alder into its favourite soil requirements if found under thin peat too. Both these species are so rare in the peat records of Lincolnshire, and as now found growing on peat, even the thinnest, unless it is a man-made mixture along a dyke side, that I have come to the conclusion it is not the natural home of either.

What species of *Ribes* can be abundant in the "fringing carrs" of Norfolk? Bird-sown ones from gardens?

The *Ulmi* forms present a most complicated problem. The *campestris* varieties seem to be found only on the gravels to the Thames valley. I suspected this as far back as the early eighties, for I hunted for, and never could find, a pure woodland of this species. As it is unknown in the northern peats, even the very latest, and practically so out of England, can it be a man-made species from hedgerow selection? It grows from root-suckers, but these are only produced plentifully when the trees are old. The *glabra* forms present nearly as difficult a problem. I have never met with a pure old wood of this species. It belongs to the Oak-Ash woods of the clays. Its area of distribution is far wider than *campestris*. It is only found in late peats, and in popular opinion "would not be grown if it were not for coffin-boards." I cannot help regarding it as the root form, if there are truly two species; for all types of trunk, branch, bark, leaf, and

root growth seem to me to shade insensibly into one another. The problems the Elms present are more interesting than any other trees we possess, for man unwittingly has greatly helped to shape their later evolution.

The authors do not seem to have worked out an intensity table for sun and wind for their underwood records. Without some such artificial help it is almost impossible to record the varying frequency of the flora. Here is one I have used for some years :—

Sun and Wind.

1. Full exposure to both.
2. Slight shade and shelter.
3. Half shade and shelter.
4. Full shade and shelter.
5. Deep shade and shelter.

The working S. and W. with the proper numbers after them record all that is required :—

Lamium Galeobdolon, S. 2, W. 4.
Viola palustris, S. 1, W. 4.
Primula "elatior," S. 1, W. 2.
Neottia Nidus-avis, S. 5, W. 5.

How much variation is caused by high contour lines of wind, shelter, aspect, or soil, to say nothing of more trifling deflecting causes found in every wood, only those who have attempted to record nature accurately can properly understand.

A. E. Woodruffe-Peacock.

Nature Study.

Nature Teaching on the Blackboard. By W. P. Pycraft, F.Z.S., and Janet Harvey Kelman. Vol. i.—Plant Life. By J. H. Kelman. 4to cl., pp. 134; 34 plates. Price not stated. London: Caxton Publishing Co.

The Aims and Methods of Nature Study: a Guide for Teachers. By John Rennie, D.Sc., F.R.S.E.; with an Introduction by Prof. J. Arthur Thomson. 8vo cl., pp. xvi, 352; 178 figures. Price 3*s.* 6*d.* London: W. B. Clive.

Eton Nature-Study and Observational Lessons. By Matthew Davenport Hill, M.A., and Wilfrid Mark Webb, F.L.S. Sm. 4to cl., pp. xvi, 174; xviii, 155; illustrated. Price 6*s.* net. London: Duckworth & Co.

The study of Natural History, which at one time occupied an important position in the curriculum of some of our public schools, seems no longer to obtain its position there. The annual reports, at one time publications of some bulk, no longer appear, and athletics, in one form or another, seem to occupy the ground formerly held by these societies. This is no doubt in great measure due to the withdrawal of those to whose fostering care the development of what is now called "nature-study" was due—the late T. A. Preston, for example, who was fortunate enough to see the results of his labours at Marlborough in the career of more

than one naturalist who has produced excellent work, and Father Gerard, who has found no successor at Stonyhurst.

But if there has been a diminution in the promotion of the study of natural history—to employ a term which has a somewhat old-fashioned sound—in our higher schools, there has been a notable increase in that direction in those devoted to primary education. The School Nature Study Union—a curious title which would be simplified by the insertion of a hyphen between the second and third words—established in 1903, under competent direction, is doing much by its summer excursions and winter meetings to carry out its aim of "bringing together, for mutual help and advice, those interested in Nature Study in general and its place in education in particular"; the Union also publishes a series of illustrated leaflets accurately written, for the use of members—those dealing with plants include "Seeds and Seedlings," "Bulbs," "Tree Twigs in Winter," and "Seeds"; they are mostly intended to be used in class, where no doubt the technical terms employed would be further explained.

Those who direct the Union and others who encourage in our schools the study and observation of nature are not likely to complain of any deficiency in the literature provided for their use. Our own pages have shown that so far as Botany is concerned, the provision of text-books of all degrees of merit is more than ample—British plants alone possess a whole literature—and the difficulty is mainly one of selection. But besides these there are now appearing books whose object is to teach how to teach, and of these three recent examples are before us for notice.

The first, and in some respects the most important, is *Nature Teaching on the Blackboard*, by W. P. Pycraft and Janet Harvey Kelman, the first volume of which, for which Miss Kelman is responsible, is devoted to "plant life." The publishers claim that this "represents an entirely new departure"; so far as natural history is concerned, this is no doubt true, although, we believe, a similar use of the blackboard was initiated for religious catechetical instruction by the Rev. D. Elsdale, which has, if we mistake not, formed the subject of a book. Miss Kelman's volume is admirably adapted to serve its purpose, and is in every way excellently carried out. It contains outline studies, suitable for blackboard reproduction, of thirty-four common, mostly British, plants, with accompanying descriptive letterpress, simply and accurately written; a certain number of technical terms are introduced, with explanations—this it is thought will prove of advantage where the work is used in more advanced classes in connection with a botanical text-book. It is rightly pointed out that the drawings can only be really helpful when used in conjunction with actual specimens; of these there should, in most if not all of the examples chosen, be no difficulty in obtaining a sufficient supply for the class:—"The object of these studies is to lead pupils to look at, to observe, and to learn to interpret nature for themselves, and that these plates can only meet this end if they are used along with living twigs, leaves, flowers, and fruits."

We may quote from the preface the following hints on the use of the book:—"The use of actual specimens will mean that the same plate must be used at different seasons. Thus, in the plates of trees, the twigs and buds that can be had in winter and early spring should be studied then, and it might be found desirable to give blackboard drawings of the leaves and fruits to make vivid to the eye the kind of tree to which the bare twig belongs. Again in late spring or early summer, when the class is studying the leafy shoot, a drawing of the twig in its winter state might be made in order to revise the earlier lesson, emphasis, however, being laid on the study of the leaves and flowers which the pupils have in their hands." There is no need to enter into a detailed criticism of the drawings, which, as has been said already, are excellently adapted to their purpose; the letterpress—as might be expected from the author of Messrs. Jacks' "Told to the Children" series of natural history books—shows an intimate knowledge of the plants described.

Dr. Rennie's *Aims and Methods of Nature Study* is described as "a guide for teachers," for whom it will be found stimulating and suggestive, as well as comprehensive. The comparatively small portion devoted to botany is well done. There are chapters on plant identification, on the study of leaves and flowers, fruits and seeds, on trees, with elementary studies on ferns and a special "lesson on buttercups": all these are fully and suitably illustrated. The various points which are especially suitable for observation, and the adaptations for special purposes—*e. g.* the dispersal of seeds—are indicated. Care is taken to make the work interesting by allusions to literary illustrations—thus the study of twigs and buds is illustrated by reference to "the ruby-budded lime," the "straight and slender" hazel-twig, "the ash-buds black in the front of March," and the like. The teacher who models his instructions on Dr. Rennie's suggestions will succeed in interesting his class, and his hearers will hardly fail to profit by such instructions. Useful books of reference are indicated, but we think that something in the way of a select bibliography would add to the general usefulness of the book.

Messrs. Duckworth have done well in bringing out in one volume the two parts of their *Eton Nature-Study and Observational Lessons*, published separately in 1903. The authors, Messrs. Matthew Davenport Hill and Wilfrid Mark Webb, have produced a useful book: the selection of subjects is excellent, the treatment simple but scientific, and the illustrations are remarkably good and very numerous. There is an interesting chapter on "Plant Associations" and useful notes on plant-drying and plant photography; the other branches of natural history seem equally well catered for. The only fault to be found with the book is its clumsy and indeed misleading title: "Eton" has no more to do with it than any other school, except that the Headmaster writes a short foreword, and it is quite as useful for young folk at any other school or at none. We regret, too, that the opportunity was not taken to page the work continuously and to combine the

indexes: the present arrangement, necessary when it was in two independent parts, is inconvenient in its present form. But it is an excellent book, and will form a useful and attractive present for young people.

Dunkelfeldbeleuchtung und Ultramikroskopie in der Biologie und in der Medezin. By N. Gaidukov. Jena: G. Fischer. 1910. 8 marks.

Professor Gaidukov has produced a book which, though of modest dimensions, is of great interest to the biologist. Recognizing the service which the ultramicroscope has rendered to physics, Gaidukov undertakes to demonstrate that, in capable hands, this instrument is destined to prove of no less value to biology. Just as it has enabled the physicist to obtain a deeper insight into the structure of celloidal bodies (soles), so there is reason to believe that it is destined to throw light on that much-discussed problem—the structure of protoplasm.

The conclusion reached by Gaidukov is that cytoplasm consists of a celloidal complex made up of a reversible and an irreversible part, and that the "plasmatic membrane" which invests the cytoplasm is of the nature, not of a celloid but of a "gel."

The advantages claimed for dark-field illumination are that it may be used effectively for the examination of objects invisible by the ordinary microscope, and that, moreover, it possesses the superiority over the method of staining that, whilst giving equally good structural differentiation, it enables the living object to be used instead of the dead preparation. The book is well written and may be recommended to all who are interested in the problem of biological science.

F. K.

BOOK-NOTES, NEWS, &c.

At the meeting of the Linnean Society on June 16, Mr. P. A. Talbot exhibited a large series of coloured drawings by Mrs. Talbot of plants from Southern Nigeria, and displayed a map and photographs of the scenery. He described the country as very hilly and densely wooded. The photographs of the Kwa gave some idea of the beauty and density of the vegetation, but none of the glory of colouring or variety of the multitudes of flowers. Right down to the water's edge grow giant arums, green on the outer sheath, but cream splashed with purple within. Behind these spring trees of every shape and tint, from mimosas, with their delicate mauve or cream balls and feathery foliage, to the huge trumpet-shaped flowers of *Gardenia physophylla*, and the heavily scented purple-splashed blooms of *G. Kalbreyeri*, or the great *Berlinia*, the white flowers of which shine with a pearl-like lustre from amid its dim dark leaves. About this river lies the boundary between the sedimentary deposits below and the crystalline rocks above. The line of demarcation runs along this parallel to the Akwa Yafe on the German Border, and the Calabar River on the other side. By far the greater part of

the district therefore is composed of metamorphic rocks in which gneiss predominates. Perhaps the most striking feature of all in these ancient forests is the hurry shown by all trees to reach the light above the thick undergrowth. Perhaps the tallest of all the bush giants are the silk-cotton trees. It is difficult to get a good photograph of these owing to the density of the surrounding bush, which would have to be cleared for a great way before a picture could be taken. These trees are often 200 to 250 ft. high, and have a girth of over 80 ft. Another photograph shows the source of the Calabar River. It was on the slope of a hill near by that a *Napoleona* was discovered, which is not only a new species, but which shows an inflorescence hitherto unknown in this interesting genus. Altogether, four new Napoleonas have been brought home—thus adding half as many again to those already known; the second has been named after Mr. Boyd Alexander, who was murdered on April 2 in Central Africa. Altogether over fifty specimens of cauliflorous trees were discovered in the district. Detailed drawings of all of these were made, but unfortunately many of the actual specimens were ruined by climatic conditions or lost in transit.

At the same meeting Dr. Stapf showed a selection of Arctic specimens collected by Capt. Bartlett during the last Peary Expedition, on Ellesmere Island, between 82° and 83° N. latitude, describing them as some of the most northerly botanical specimens extant, and Mr. A. W. Hill showed a specimen in spirit of a barren stem of *Equisetum Telmateia* Ehrh., in which about half of the nodes disappeared in a spiral arrangement. The paper of the evening was by Dr. Redcliffe N. Salaman, on "Male Sterility in Potatoes, a dominant Mendelian character, with remarks on the shape of the pollen in wild and domestic varieties." The paper was based upon the author's experiments in his own garden at Barley, near Royston, Herts, during the past four years; but on this occasion he confined his remarks to the pollen, leaving other points for some future occasion. He pointed out that "dead" pollen-grains, or none, were usually associated with flowers of heliotrope colour.

From the *Transactions of the British Mycological Society* for 1909 (Worcester, 1910, 101 pp., 4 plates) we learn that that body held a spring foray in addition to the autumn one. A number of the members met at Shrewsbury on May 28th for a week's collecting, and secured no fewer than 194 species of fungi. The majority were microscopic plants, and included a large number of Ascomycetes, a class of fungi rather plentiful in the early season of the year. The *Transactions* include some papers of exceptional interest, in addition to the accounts of the two forays. Professor Potter's Presidential Address on Bacteria in their Relation to Plant Pathology deals with an increasingly important subject, and embodies his own researches and observations. Professor René Maire, who assisted the foragers in the autumn field-work at Baslow, was successful in finding and determining a number of interesting Hymenomycetes. He publishes a description of these, and also contributes an important paper on the "Systematic Determination of *Russulæ*"—a section of fungi with which he is

particularly well acquainted. In this paper he places at the disposal of mycological students the results of years of observation and research on *Russula* in the field and in the laboratory. Other interesting papers are by Mr. A. D. Cotton on *Clavaria*, Mr. W. B. Allen on Mycetozoa, Miss A. Lorrain Smith on Lichen Parasites and on New and Critical British Microfungi, and by Mr. Carleton Rea on Larger Fungi. There is also an obituary notice of the late Dr. C. B. Plowright, one of those to whom the Society owes its existence, by whose death the members have to mourn the loss of a warm friend, a loyal companion, and a distinguished mycologist.—A. L. S.

The National Museum of Science and Art, Dublin, is to be congratulated on its enterprise in issuing at a penny a *Hand List of Irish Flowering Plants and Ferns*. The list—a pamphlet of 32 well-printed pages—is moreover noteworthy in that it follows the classification of Engler's *Syllabus der Pflanzenfamilien*, the arrangement more familiar to British and Irish botanists being given in an appendix. The nomenclature is that of the British Museum *List of Seed-plants*, with certain corrections; it is to be regretted that one of the compilers of that list was not consulted, as some additional corrections, reserved for a new edition, might have been made here. The Irish distribution of each species is indicated. The list was prepared by Miss M. C. Knowles, an assistant in the "Botanical Division" of the Dublin Museum.

The latest instalment (parts 5 and 6) of Karten and Schenk's useful *Vegetationsbilder* (published by G. Fischer of Jena) is devoted to the Flora of Ireland. It consists of a brief introduction on the Flora and descriptions of the plates, by Prof. Johnson, of Dublin; the plates themselves—twelve in number, two species being figured on some of them—are from photographs by Mr. R. Welsh, of Belfast. Some of these represent the vegetation in connection with the landscape of which they form part; others are of individual species *in situ*; among these *Daboecia polifolia* in Connemara is especially characteristic; the size of *Erica mediterranea* is conveyed by the head of a boy appearing from among it. The price of the two parts is 8 marks.

Mr. John Ramsbottom, B.A., of Emmanuel College, Cambridge, late Exhibitioner of that College and Robert Platt Biological Research Scholar at Victoria University, Manchester, has been appointed an Assistant in the Department of Botany, British Museum.

We regret to record the recent deaths of Mr. S. A. Stewart, of Belfast, and of Mr. John Bennett Carruthers, of whom some account will appear in an early issue.

Newspaper Botany.—The *Daily News* continues to illuminate the botanical world; in its article on "The Brittle Man" in the issue of July 2nd we read: "The medicine given him is a tincture of arbor vitæ, the juice of a small flowering herb known in medicine as thuja, found wild in this country, but more common in America." "This," says the correspondent who sends it, "is rather good, even for the *Daily News*."

OXFORD UNIVERSITY PRESS.

Knuth's Handbook of Floral Pol=

lination, based upon Hermann Müller's work, 'The Fertilization of Flowers by Insects,' translated by J. R. Ainsworth Davis. Vol I, morocco back, 21*s*. net; cloth, 18*s*. net. Vol II, morocco back, £1 15*s*. net; cloth £1 11*s*. 6*d*. net. Vol. III, morocco back, £1 11*s*. 6*d*. net; cloth, £1 8*s*. net.

A History of Botany, 1860–1900.

Being a continuation of Sachs' History of Botany, 1530–1860. By J. Reynolds Green. Cr. 8vo, 9*s*. 6*d*. net.

Warming's Oecology of Plants.

An Introduction to the study of Plant-Communities. Prepared for publication in English by Percy Groom and I. Bayley Balfour. Morocco back, 10*s*. net; cloth 8*s*. 6*d*. net.

Schimper's Geography of Plants.

Authorized English translation by W. R. Fisher, revised by P. Groom and I. Bayley Balfour. With maps, collotypes, portrait, and 407 other illustrations. Morocco back, £2 2*s*. net.

Jost's Lectures on Plant Physio=

logy. Authorized English translation by R. J. Harvey Gibson. Morocco back, £1 4*s*. net; cloth £1 1*s*. net.

Pfeffer's Physiology of Plants.

A treatise upon the Metabolism and Sources of Energy in Plants. Second fully revised Edition, translated and edited by A. J. Ewart. Vol. I, morocco back, £1 6*s*. net; cloth, £1 3*s*. net. Vol. II, morocco back, 16*s*. net; cloth, 14*s*. net. Vol. III, completing the work, morocco back, £1 1*s*. net; cloth, 18*s*. net.

Goebel's Organography of Plants.

Authorized English edition by I. Bayley Balfour. Part I, General. Morocco back, 12*s*. net; cloth. 10*s*. net. Part II, Special. Morocco back, £1 4*s*. net; cloth, £1 1*s*. net.

Solereder's Anatomy of the Di=

cotyledons. Translated by L. A. Boodle and F. E. Fritsch. Revised by D. H. Scott. Two volumes, morocco back, £1 7*s*. 6*d*. net each; cloth, £1 4*s*. net each.

On the Physics and Physiology

of Protoplasmic Streaming in Plants. By A. J. Ewart. With 17 illustrations. 8*s*. 6*d*. net.

List of British Plants. By G. C. Druce.

Crown 8vo, paper covers, 2*s*. 6*d*. net; cloth interleaved, 3*s*. 6*d*. net.

Floral Mechanism: Diagrams and Descrip-

tions of Common Flowers, arranged as an introduction to the systematic study of Angiospermus. By A. H. Church. Royal 4to. Part I, Types I–XII (Jan. to April). With coloured plates and numerous other figures. 21*s*. net.

LONDON: HENRY FROWDE

OXFORD UNIVERSITY PRESS, AMEN CORNER, E.C.

PHYSICAL CHEMISTRY:

ITS BEARING ON BIOLOGY AND MEDICINE.

By JAMES C. PHILLIP, M.A., Ph.D., D.Sc.

Assistant Professor in the Department of Chemistry, Imperial College of Science and Technology, London.

viii. + 312 pages. 7s. 6d. net.

In this book are given in simple and lucid language the principles of Physical Chemistry in their bearing upon biology and physiology, together with the results of the most recent researches in this field. No advanced mathematical knowledge is assumed in the reader, and the book is especially intended for biologists, botanists, and all who are concerned with the application of physico-chemical laws in the study of the living cell.

London: EDWARD ARNOLD, 41 and 43 Maddox St., W.

WANTED.—THOMPSON'S **"LISTE DES PHANEROGAMES, &c."** Offers to Publishers, 54, Hatton Garden, London, E.C.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of May Number. — The Inter-Relationships of the Bryophyta. Marchantiaceæ (Figs. 18–29), by F. CAVERS. Notes on Recent Literature: "Ancient Plants," by A. C. S. "On a Little Known Type of Vascular Structure Re-described by P. Bertrand," by I. M. P. B. "Hayward's Botanist's Pocket-Book," by C. E. M.

Subscription-Price, 15*s.* *per annum* (*ten numbers*) *post free.*
Price of single number, 2*s.* *Price of double number*, 4*s.*

Published Monthly by the Editor, The Botany School, Cambridge.

BOUND SEPARATELY IN PAPER COVER. PRICE 1S. 6D. POSTAGE 1D.

THIRD SUPPLEMENT

TO THE

BIOGRAPHICAL INDEX OF BRITISH & IRISH BOTANISTS.

---

254 PP., DEMY 8VO, CLOTH EXTRA, PRICE 9S. 6D. NET.

BIOGRAPHICAL INDEX

OF

DECEASED BRITISH & IRISH BOTANISTS.

BY

JAMES BRITTEN, K.S.G., F.L.S., & G. S. BOULGER, F.L.S.

BOUND UP TOGETHER WITH

FIRST (1893–97) & SECOND (1898–1902) SUPPLEMENTS.

The SUPPLEMENTS can also be had separately. price 1/6 each; postage 1d.

London: WEST, NEWMAN & CO., 54, Hatton Garden. E.C.

Subscriptions to the Journal of Botany (16s. post free) for 1910 should be sent to West, Newman & Co.

No. 573 SEPTEMBER, 1910 Vol. XLVIII

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

John Bennett Carruthers (1869-1910). (With Portrait) 217

Alabastra Diversa.—Part XIX. By Spencer le M. Moore, B.Sc., F.L.S. 219

Stellaria Dilleniana Moench as a British Plant. By Frederic N. Williams, F.L.S. 223

Notes on Scottish Plants. By C. E. Salmon, F.L.S. 225

Notes on South Kerry Plants. By H. Stuart Thompson 227

The Brussels Congresses 228

The "Biographical Index of British Botanists" 231

PAGE

Short Notes.—Berkshire Plants—*Saxifraga Geum* × *serratifolia*—*Colchicum autumnale* L.—*Lathyrus tuberosus* in Kent.—Peloria State in Foxglove—Distribution of the Holly—*Euphrasia minima* in North Devon—*Juncus tenuis* in Hants 233

Reviews:—

Prodromus Floræ Britannicæ. By Frederic N. Williams 235

Diseases of Cultivated Plants and Trees. By George Massee .. 238

Book-Notes, News, &c. 240

Supplement.—The British Roses. By Major A. H. Wolley-Dod (continued). .

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates **was at the same time augmented.**

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had price 1s. 6d. each.

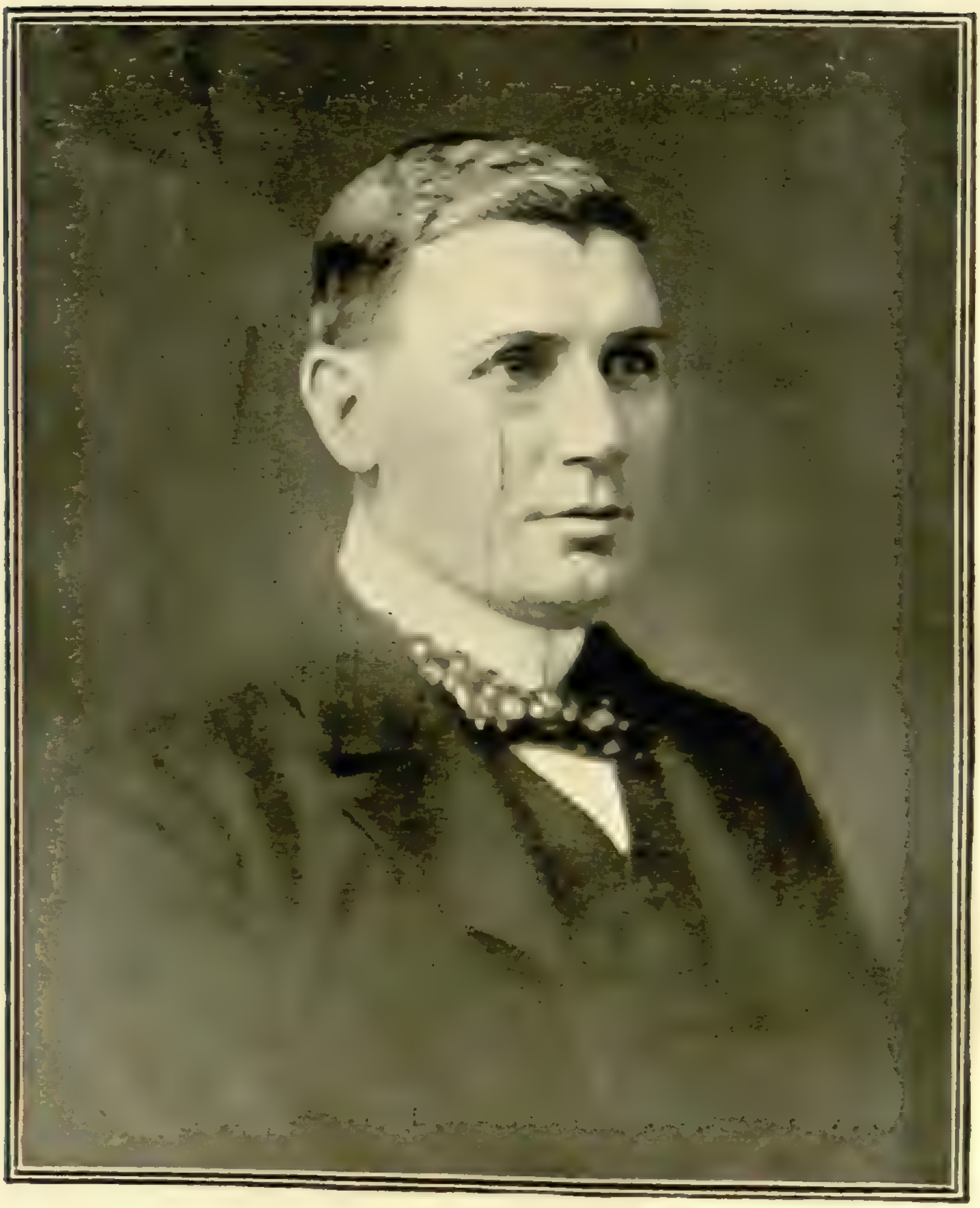
AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

2 pages	25 copies		4s.	4 pages	25 copies		5s.	8 pages	25 copies		8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.



J. B. Lamutte

JOHN BENNETT CARRUTHERS (1869–1910).

(WITH PORTRAIT.)

It is difficult for those who have themselves attained a certain age to realize that time, which seems to have passed so rapidly with them, has progressed equally quickly with their juniors. The rapidity with which younger folk grow up is always surprising and even puzzling: this is, perhaps naturally, often little realized by parents, who are—and still more were—wont to resent what seems to them the too early assertion of independent thought and action on the part of those whom they have known from the cradle, and whose school age they, unconsciously, strive to assume long after their children have ceased to be *in statu pupillari*. This development also makes the more elderly folk seem old; this is not a pleasant feeling and is frequently, albeit unconsciously, resented; the "fear of the rising generation," expressed by one of Ibsen's characters, is much commoner than we like to admit. In any case the realization is difficult, and sometimes startling; it is so in the case of the present writer, whose first introduction to a leading professor of botany discovered a shy boy hiding under a table, and who made the acquaintance of a well-known official botanist through the medium of certain difficulties presented by elementary arithmetic. With the subject of this memoir he can claim acquaintance at even an earlier stage, though his more vivid recollection is of a boy who disturbed the somewhat stagnant atmosphere of the old Department of Botany at Bloomsbury with his high spirits, and perhaps sometimes a little hindered the work of the officials by his liveliness and natural desire for amusement in which he was anxious they should participate.

This geniality and brightness characterized throughout life John Bennett Carruthers, whose death, at the early age of forty-one, has deprived Colonial botany of one of its most popular officials. Born at Islington on January 19, 1869, and named in compliment to John Joseph Bennett, whom his father had just succeeded as Keeper of the Department of Botany, young Carruthers may be said to have been predestined to a botanical career. His capabilities in that direction were not however early apparent; at Dulwich College, where he was educated, his bent was rather in the direction of athletics, and it was not until after his education had been completed at the School of Mines and at University College that he took up the study of Algæ under the direction of Mr. George Murray, then Assistant for Cryptogams in the Botanical Department. He then went to Greifswald University, with a view of prosecuting his algological studies under Prof. Schmidt.

Returning to England, John Carruthers became assistant to his father in his capacity of Consulting Botanist to the Royal Agricultural Society, continuing this work until the end of 1897, being chiefly engaged in problems affecting the quality of seeds and the diseases affecting farm-plants. During these years he

lectured on botany for four spring sessions at Downton Agricultural College, and was assistant lecturer on Botany at the Royal Veterinary College. In 1891 he published a memoir on larch canker in the *Journal of the Royal Agricultural Society*, and in 1892 a paper on the cystocarps of some species of *Callophyllis* and *Rhodomenia* in the *Journal of the Linnean Society*, of which body he became a Fellow in 1890.

In 1897 Carruthers was requested by the Planters' Association to visit Ceylon to investigate the disease which was then ravaging the cocoa plantations. Here he spent the year 1898, and, as the result of his investigations into the cause of attack and his experiments as to the growth and distribution of the fungus, was able to suggest remedies for arresting the disease. These proved so efficient that the planters urged the Government to secure the services of a qualified botanist to deal with diseases of cultivated plants. In 1900 Carruthers was appointed Mycologist to the Government of Ceylon and Assistant Director of the Peradeniya Gardens. In this year he published a paper on "Plant Sanitation" in the *Contemporary Review*, which had been preceded by one—"Wanted, Plant Doctors"—in the same magazine for 1899. The Cacao disease was the subject of three Reports.

In 1904 Carruthers was invited to become Director of Agriculture in the Malay States. Here he addressed himself to the introduction of suitable plants to cultivation and to the development of those already grown. He was also engaged in the organization of this new department and in securing qualified assistants to deal with the various matters connected with agriculture. He gave special attention to the cultivation of rubber-yielding plants, for the growth of which he found the climatal conditions singularly well adapted. Although his stay in Malaya extended to little more than four years, Carruthers was recognized as an authority on the cultivation of rubber, on which he wrote several papers. In 1906 he was elected a Fellow of the Royal Society of Edinburgh.

In the beginning of 1909, Carruthers was asked by the Colonial Office to transfer his sphere of labour to Trinidad. After much anxious consideration and with not a little hesitation he decided to accept the invitation, and was appointed Government Botanist and Assistant Director of Agriculture. The change proved disastrous. Making an official visit of twelve days to Tobago last March, he returned to Trinidad with a fever: after seven weeks' illness, he had to undergo an operation for an abscess in the chest; this was temporarily successful, but after some days blood-poisoning and pneumonia set in, and the illness terminated fatally on the 17th of July.

Apart from the papers already mentioned and his official Reports Carruthers contributed little to botanical literature; a review from his pen of Dr. Willis's book on *Agriculture in the Tropics* will be found in this Journal for 1909, p. 390.

The personal qualities which contributed no less than his scientific ability to Carruthers's success have already been referred

to: genial, sympathetic, and loyal to friends, he was eminently popular in every relation of life, social and official alike, and his death is felt as a personal loss by a wide circle of friends. In his earlier days he took an active part in work among boys and lads, especially in the Boys' Brigade, in connection with the church to which he was attached; his bright breezy nature rendered such work highly congenial to him. An official letter written to his widow—he had married in 1900—says: "The news of Mr. Carruthers's death was received with great regret by all who knew him as a most able and energetic officer and a genial friend in social life, and the Colony has lost the services of a very capable expert at a time when they were most needed."

We are indebted for the use of the portrait which accompanies this notice to the editor of the *India-rubber Journal*, in whose issue for July 25 it appears.

ALABASTRA DIVERSA.—Part XIX.*

By Spencer le M. Moore, B.Sc., F.L.S.

1. Rubiacearum Africanarum novarum pugillus.

Pentas decorus, sp. nov. Caule erecto simplici valido subtereti superne compressiusculo glabro, foliis 3–4-natim verticillatis superioribus oppositis sessilibus brevissimeve petiolatis oblongo-ovatis apicem versus gradatim attenuatis apice basique obtusis membranaceis utrinque glabris vel præsertim ad nervos puberulis, stipulis sæpius bipartitis segmentis lineari-subulatis apice induratis dorso pubescentibus, cymis brevibus densi etsi paucifloris glabris, bracteis parvulis subulatis pubescentibus, florum subsessilium ovario subsphæroideo aliquanto compresso glabro 2-loculo, calycis lobis 5 oblongo-triangularibus acutis margine ciliatis ceterum glabris quinto quam ceteri paullo breviore, corollæ magnæ tubo superne gradatim dilatato extus sparsim puberulo intus faucibus hirsuto lobis 5 oblongis apice incurvis acutis puberulis vel fere glabris ima basi intus hirsutis, staminibus tubo circa 2 cm. infra os insertis, stylo exserto stigmatis lobis oblongis.

Hab. Congo Free State, Luendarides, in forest; *Kässner*, 2419.

Folia solemniter 6–8 cm. long., 2–3 cm. lat., in sicco brunneo-viridia; costæ utrobique satis perspicuæ etsi tenues; petioli summum 2 mm. long. Stipulæ 1–2·5 mm. long. Bracteæ 2–3 mm., pedicelli crassi, summum 2 mm. long. Ovarium 2·5 mm. long. Calycis limbus 2 mm. long.; lobi 4·5 mm. (lobus quintus 4 mm.). Corollæ tubus fere 9 cm. long., inferne 2·5 superne 4·5 cm. diam.; lobi (ut tubi pars superior) crassi, rugati, 1 cm. long. Filamenta 4·5 mm., antheræ 7 mm. long. Stylus 10 cm. long., arctissime microscopice albo-papillosus. Stigmatis lobi vix 2 mm. long.

---

* Specimens of all the plants described in this paper are in the Herbarium of the British Museum.

Differs from *P. nobilis* S. Moore in the glabrous stem, the glabrous or almost glabrous leaves, the short stipules, the short ciliate lobes of the calyx, the exserted style, &c.

Virecta Kaessneri, sp. nov. Caule erecto sursum ramoso tereti puberulo demum glabro novellis dense pubescentibus, foliis lanceolatis longe acuminatis basi acutis vel obtusis vel etiam rotundatis supra appresse puberulis subtus subtiliter pubescentibus petiolis brevibus pubescentibus fultis, stipulis anguste lanceolato-triangularibus acuminatis, cymis densis multifloris pubescentibus, pedicellis valde abbreviatis, bracteis linearibus acuminatis, calycis pubescentis segmentis 5 quorum 4 maxime elongatis filiformibus quinto minimo, corollæ extus pubescentis intus annuloso-villosi tubo sursum gradatim amplificato lobis 6 angustissime linearioblongis superne coartatis tubum subæquantibus, staminibus 6 longe exsertis, disco maxime elevato, stylo integro cylindrico truncato.

Hab. Kibanda, Lake Tanganyika, on slopes of mountain; *Kässner*, 3052.

Folia vulgo 3·5–5 × 1–1·3 cm., tenuiter membranacea, in sicco brunneo-viridia, subtus griseola. Cymæ circiter 2 × 3 cm. Bracteæ ± 4 mm. long. Ovarium subglobosum, 1 mm. long. Calycis segmenta 8–11 mm. long., quintum ± 1 mm. Corollæ tubus 8 mm. long., inferne ·75 mm. ore 3·5 mm. diam.; lobi 9 mm. long. Filamenta 13 mm., antheræ 3 mm. long. Discus fere 1·5 mm. alt. Stylus 2·6 cm. long., glaber.

Much like *V. multiflora* Sm. in appearance, but markedly different in calyx, corolla, and disk.

Pentas verticillata K. Schum. ex S. Elliot in Journ. Linn. Soc. xxxii. 431. Var. PUBESCENS, var. nov. Caulis necnon folia dense molliterque pubescentes.

Hab. Uganda, Mabira Forest; *E. Brown*, 470. [Also in Herb. Kew: Toro; *Doggett*, 5.]

Canthium Kitsoni, sp. nov. Verisimiliter elatum ramulis sat validis teretibus saltem superne bene foliosis glabris novellis puberulis, foliis brevipetiolatis ovato- vel lanceolato-oblongis apice cuspidato-attenuatis ipso obtusis basi subrotundatis papyraceis utrinque glabris, stipulis inferne lanceolatis superne subulato-acuminatis glabris cito evanidis, floribus parvis in paniculas axillares abbreviatas glabras dense aggregatis, pedunculo communi valido longitudinem ipsius paniculæ circa æquante, pedicellis gracillimis ovaria longe excedentibus, floribus 4-meris, ovario parvulo subhemisphærico glabro, calycis limbo abbreviato in lobos late triangulares obtusos acutosve diviso puberulo lobis ciliatis, corollæ extus glabræ intus paullo infra medium pilorum annulo decurvorum onustæ tubo ovarium plus quam duplo superante lobis tubo brevioribus ovatis acutis cito reflexis, stylo longiuscule exserto glabro, stigmate calyptrato.

Hab. S. Nigeria, dry zone of Western Province; *A. E. Kitson.*

Foliorum limbus 7–9 cm. long., 3·7–4·3 cm. lat., in sicco supra

fuscus subtus viridi-griseus; ord. sec. costæ utrinque 6, ut costa centralis pag. sup. planæ, pag. inf. eminentes; reticulum laxum, parum aspectabile; petioli circiter 1 cm. long. Stipulæ 4 mm. long., dorso carinatæ. Pedunculus communis circa 9 mm. long.; paniculæ 2·5 cm. diam., multiflores. Pedicelli plurimi 4–6 mm. long. Bracteæ ovatæ, acutæ obtusæve, ± 1 mm. long. Ovarium ægre 1 mm., calycis limbus ·5 mm. long. Corolla in toto 4·75 mm., tubus 2·75 mm. long.; lobi 2 × 1·3 mm. Filamenta ·3 mm. long.; antheræ oblongo-ovatæ, obtusæ, basi sagittulatæ, 1·2 mm. long. Stylus 6 mm., stigma vix 1 mm. long.

Differs from *C. Afzelianum* Hiern in the larger leaves, dense inflorescences, glabrous peduncles and pedicels, smaller and in other respects diverse calyx and corolla, and short style.

Vangueria nigerica, sp. nov. Inermis foliis brevipetiolatis oblongo-ovatis juxta apicem angustatis apice necnon basi obtusis pergamaceis pag. sup. appresse puberulis pag. inf. piloso-pubescentibus, stipulis subulatis acutis glabris in sicco fuscis, floribus mediocribus in cymis axillaribus brevissimis perpaucifloris puberulis dispositis, pedicellis ovarium excedentibus, ovario subgloboso basi puberulo 6-loculari, calycis limbo brevissimo cupulari 6-dentato glabro, corollæ tubo cylindrico-campanulato extus glabro intus supra medium annuloso-villoso quam lobi 6 lanceolati caudato-acuminati extus puberuli intus subtiliter pubescentes paullo breviore, antheris subinclusis, stylo crassiusculo glabro, stigmate leviter exserto mitræformi.

Hab. South Nigeria, dry zone of West Province; *A. E. Kitson.*

Folia 5–7 cm. long., 2·2–2·8 cm. lat.; petioli 2–3 mm. long. Stipulæ 3–4 mm. long. Cymæ (corollis inclusis) summum 1 cm. long.; pedicelli circa 2 mm. Ovarium 1·5 mm., calycis limbus ·25 mm. long., hujus dentes vix totidem. Corolla tota 7 mm. long.; tubus 3 mm. long., basi vix 3 mm. ore 4·5 mm. long.; lobi 4 mm. long. Antheræ ori insertæ, subsessiles, ovato-oblongæ, infra apicem paullo attenuatæ, basi obtusæ breviterque barbellatæ, dorso puberulæ, crassiusculæ, 2 mm. long. Stylus 5 mm., stigma 1 mm., long.

Differs from *V. canthioides* Benth. in absence of spines, larger more hairy leaves, short pedicels, hexamerous flowers, &c.

Vangueria Kaessneri, sp. nov. Verisimiliter fruticulosa ramis strictis teretibus pubescentibus tandem glabris sursum foliosis novellis dilute fulvo-tomentosis, foliis oblongo-lanceolatis obtusis basin versus in petiolum brevem attenuatis supra appresse pubescentibus subtus tomentosis, stipulis lineari-lanceolatis acutis dorso tomentosis, floribus in fasciculis densis axillaribus breviter pedunculatis plurifloris tomentosis digestis, bracteis linearibus vel lineari-oblongis dorso tomentosis, pedicellis bracteis plane brevioribus, ovario subhemisphærico 5-loculari ut calycis segmenta 5 triangulari-subulata quam sese paullulum longiora tomentosis, corollæ mediocris tubo late cylindrico extus tomentoso lobis triangularibus longiuscule acuminatis extus tomentosis circa æqui-

longo, antheris subinclusis, stylo breviter exserto crassiusculo, stigmate cylindrico-pileato utrinque truncato.

Hab. Katenina Hills, between bushes, Mt. Kundelunga, under trees, Kibanda, Lake Tanganyika; *Kässner*, 2189, 2723, 3052.

Folia vulgo ± 5 cm. long., 8–11 mm. lat.; petioli tomentosi, circa 3 mm. long. Stipulæ 3·5–4 mm. long. Pedunculi summum 4 mm. long., sæpissime breviores; pedicelli circa 2 mm. long. Ovarium 3 mm. long. Calycis segmenta 4 mm. long. Corollæ tubus et lobi 4–4·5 mm. long., ille 2 mm. lat., intus juxta medium annulo pilorum deflexorum onustus. Stamina faucibus inserta; filamenta ·7 mm. long.; antheræ anguste oblongo-ovoideæ breviter incurvo-appendiculatæ, 1·5 mm. long. Stylus 6 mm. long., stigma 1 mm.

Near *V. velutina* Hiern, from which it differs in shape of leaf, and in calyx and corolla.

No. 2140, from Lukanda River, N.W. Rhodesia, is a form with larger leaves (4–7·5 × 1·4–3·3 cm.).

Psychotria spithamea, sp. nov. Suffrutex circiter spithameus caule simplici erecto inferne nudo pubescente dein glabro, foliis obovato-oblongis apice rotundatis ipso obtuse acutis mucronulatisque basi in partem attenuatam tandem petioliformem gradatim productis pergamaceis utrinque præsertim in costis subtiliter puberulis in sicco dilutissime griseo-puniceis, stipulis bipartitis segmentis lanceolato-oblongis acuminatis integris vel fissis puberulis, cymis pseudoterminalibus pedunculatis quam folia multo brevioribus pubescentibus, bracteis parvulis setaceis vel setaceo-subulatis acuminatis, floribus mediocribus pedicellis manifestis puberulis fultis, ovario subhemisphærico aliquanto compresso puberulo, calycis paullo ultra medium divisi puberuli lobis 5 lanceolato-triangularibus acuminatis, corollæ tubo calycem fere duplo excedente sursum gradatim dilatato extus glabro intus dimidio superiore villoso lobis quam tubus paullo brevioribus oblongis acutis glabris, antheris breviter exsertis, stylo incluso.

Hab. N.W. Rhodesia, Katenina Hills, among trees; *Kässner*, 2187.

Folia 9–13 cm. long., supra medium 2–2·5 cm. lat. Stipulæ diutule persistentes, 3 mm. long. Cymæ fere 3 cm. long. (pedunculus 13 mm. æquans), 1·5–2·5 cm. diam. Bracteæ circa 2 mm. long., pedicelli 1·5 mm. Ovarium 1·25 mm., calycis limbus 1·25 mm., lobi 2 mm. long. Corollæ tubus ægre 5 mm. long., basi 1·2 mm. ore 3·2 mm. lat.; lobi 4 mm. long. Filamenta faucibus inserta, 2 mm. long.; antheræ vix totidem. Stylus 3·2 mm. long.; stigmatis rami oblongi, fere 2 mm. long.

A plant with somewhat the appearance of *P. albidocalyx* K. Schum., but quite different from it in leaf and flower.

(To be continued.)

STELLARIA DILLENIANA Moench AS A BRITISH PLANT.

By Frederic N. Williams, F.L.S.

On August 3rd of last year, when searching a marshy meadow by Walton Bridge, Middlesex, about one hundred yards from the river Thames, I found a *Stellaria* just coming into flower, which seemed to be different from any other British forms of *Stellaria*. It was almost hidden in the matted grass, and was of the same tint of green as the grass with which it grew. Associated with it was *S. palustris*, noticeable from its glaucous leaves, but long ago out of flower. There was no *S. graminea* within hail of the spot, nor is this plant ever found growing in marshy places. The glaucous *S. uliginosa* was out of the question, and there was nothing of the habit of *S. graminea* about the plant.

Several specimens were collected (the plant was quite plentiful in the lower part of this sloping meadow), and later in the day examined at leisure. They agreed very well with the plant described as *Stellaria palustris* var. *viridis* by Fries, Nov. fl. Suecic. Mant. iii. p. 191 (1842). Under this variety, however, Fries gives as synonyms *S. Laxmanni* Fisch. ex Cand. Prodr. i. p. 397 (1824), and *S. Dilleniana* Moench, Enum. plant. Hassiæ, p. 214, t. 6 (1777); Fries has not, however, given the references here cited in full. The former is a large-flowered plant, and the latter a small-flowered one, and more recent authors have separated these two, retaining Fries's varietal name for the large-flowered plant. Whether they should be separated is a point for discussion. Specimens were sent out to several critical botanists for examination under Fries's name of *S. palustris* var. *viridis*, and the fact was briefly recorded in the Report issued in the current year of the Botanical Exchange Club (p. 413). The Walton Bridge plant is the small-flowered form, and is the plant described as *S. palustris* var. *parviflora* f. *viridis* by Rouy & Foucaud, Fl. de France, iii. p. 233 (1896). The specimens collected so exactly agree with Moench's original description, which is an excellent one and carefully drawn up, that it is here transcribed:—

"Caulis pedalis, decumbens, tetragonus, lævis, glaber, dichotomus, fragilis. Folia opposita sessilia, lineari-lanceolata, glabra, integerrima, patentia, pallide viridia. Stipulæ binæ oppositæ, membranaceæ, in medio pedunculorum. Pedunculi uni-biflori, terminales, unciam unam semis longi. Calyx lævis pallide viridis, laciniis lanceolatis acuminatis petalis æqualibus, oris albidis membranaceis. Petala alba, bifida lineata. Antheræ fuscæ. Floret Augusti, Septembri."

The station given by Moench is in a ditch communicating with a stream, and still more important is the time of flowering—August and September. On visiting the spot at Walton Bridge again on the last day of August, 1909, I found the plants in full flower, and still later, on October 2nd, they were in fruit. I know of no other British form of *Stellaria* so late in flowering. On

August 3rd of the present year, the anniversary of the find, I again visited the spot, and found the plants as before just in flower. Several of the characters given by Moench are carefully chosen. "Fragilis" is especially apt; none of the British Stellarias, except *S. Holostea*, are so brittle as this form. "Stipulæ" of course means "bracts." The height of this Thames-side plant, and the length of the peduncles, agree exactly with Moench's details. "Pedunculi uni-biflori" is also an important point. The type of inflorescence is a simple dichasium of three flowers. I noticed that the first developed was the central flower, followed some days afterwards by the first lateral flower. If the second lateral flower was developed at all, it only followed at a considerable interval after the first lateral, and common peduncles with two flowers only to the dichasium were frequent.

There is no doubt about the identity of *S. Dilleniana* with *S. graminea* var. *β* Linn. Sp. Plant. p. 422, as they are both founded on the same plant, described as "Alsine aquatica folio gratiolæ, stellato flore" by Dillenius, Cat. pl. Gissam, p. 58 (1719). It is true that *S. graminea* var. *β* Linn. has hitherto been identified with *S. palustris* Retz. [1795] (= *S. glauca* With. [1796]); but if these two plants belong to the same species, as many critical botanists would admit, then, even apart from reasons of priority, and solely on the ground of both being founded on the same Dillenian plant, *S. Dilleniana* (1777) would be the correct name of the species, as well as being earlier in date.

This Walton Bridge plant seems to differ, however, in many points from *S. palustris* as understood by English botanists, not the least important of which is the late flowering, and producing fruit in the first days of October. The leaves, bracts, and calyx are quite glabrous, whereas in *S. graminea* the leaves are ciliate (more evident in the lower half towards the base), as also are the bracts, and further, the outer sepals are ciliate along the margin.

A synonym of *S. palustris* var. *viridis* Fries, under another specific name, is *S. glauca* var. *virens* G. F. W. Meyer, Chlor. Hannov. p. 198 (1836). The same name for a similar plant is used independently by Fenzl in Ledebour's Fl. Rossica, i. p. 390 (1842). But Fenzl divides the variety into lusus 1 and lusus 2, and it is the latter that agrees with the small-flowered plant. There is every reason to believe that this lusus 2 is identical with *S. glauca* var. *parviflora* Klett & Richter, Fl. Leipzigs, p. 385 (1830), but I have not seen a copy of this local flora.

Rouy & Foucaud, *l. c.*, describe this plant, to which they adduce *S. Dilleniana* as a synonym, as "plante d'un vert pâle, ordinairement pauciflore," but give no localities for this particular form.

Leers, Fl. Herborn. p. 107 (1775), has also described a "Stellaria Dilleniana"; but it is so obviously a description of *S. uliginosa* Linn., and its supposed connection with the plant mentioned by Dillenius is so evidently an error of determination, that it may be left out of account. And again, *S. Dilleniana* of Reichenbach's Fl. Germ. excurs. p. 784 (1832) is no more than a form (or state)

of *S. graminea* with somewhat longer petals, and could not be mistaken for *S. Dilleniana* Moench.

Last season was too wet to make repeated observations of the plants after formation of the capsules, and the meadow later on was too spongy to dislodge more specimens from the rank and sodden vegetation in which they were embedded; but from such notes as were made there was nothing to impair the conclusions drawn from comparing this marsh-land *Stellaria* with the plant so clearly described by Moench, and so well figured.

The distribution of *S. Dilleniana* (so far as it is definitely recorded) seems to include France, Germany, the south of Norway, Central Russia, and possibly Denmark. It would probably be found to occur elsewhere in this country, though liable to be overlooked on account of the matted vegetation amongst which it grows. I have not come across any examples to match it in the separate British Herbarium of the Natural History Museum. It may be found to occur in other marshy meadows along the Thames between Sunbury and Laleham.

NOTES ON SCOTTISH PLANTS.

By C. E. Salmon, F.L.S.

In September last year my friend Mr. A. Wallis sent me notes and specimens of plants found by him during the summer in Westerness (v.-c. 97), Skye (v.-c. 104), and West Ross (v.-c. 105). I give a list of those that seem of interest, marking with an asterisk those that I believe to be new county records. *Luzula arcuata* was a surprise upon a mountain so well worked as Ben Nevis! All the stations are in Skye, unless otherwise noted.

Thalictrum alpinum L. Coolin Mts.

Trollius europæus L. Coolin Mts.

Castalia alba Wood. Tarns near Sligachan.

Corydalis claviculata DC. Kyle Akin, on the bracken thatches of cottages. In similar situations at Balmacara (v.-c. 105).

Arabis petræa Lam. Coolins!

**Subularia aquatica* L. Tarn, Sligachan.

**Lepidium Smithii* Hook. Brittle river-bed.

Silene acaulis L. Coolins.

Sagina nodosa Fenzl. Loch Brittle.

**Stellaria Holostea* L. Scarce, mountain limestone, Loch Cill Chriosd.

Hypericum Androsæmum L. Basalt cliffs, Loch Brittle. No personal authority in Top. Bot.

**Lotus uliginosus* Schkuhr. Loch Brittle.

Dryas octopetala L. Loch Cill Chriosd. No personal authority in Top. Bot.

Geum rivale L. Sligachan.

Rubus saxatilis L. Coolins.

Alchemilla alpina L. Coolins.
Myriophyllum alterniflorum DC. Loch, Sligachan.
Sedum roseum Scop. Coolins, and beach and cliffs, Talisker.
Saxifraga oppositifolia L. Coolins.
S. stellaris L. Coolins! No personal authority in Top. Bot.
Galium boreale L. Sligachan.
Gnaphalium supinum L. Coolins.
Antennaria dioica Gaertn. Coolins.
*†*Matricaria suaveolens* Buchen. Kyle Akin.
Saussurea alpina DC. Coolins.
Cnicus heterophyllus Willd. Sligachan.
Lobelia Dortmanna L. Sligachan.
**Primula veris* L. Quirang.
Gentiana campestris L. Sligachan!
†Mimulus Langsdorffii Donn. Sligachan.
Veronica Tournefortii C. Gmel. Cultivated ground, Sligachan.
**Euphrasia brevipila* B. & G. Sligachan!
**Rhinanthus major* Ehrh. c. *apterus* Fr. Waste ground near the village of Lochcarron, W. Ross! (v.-c. 105).
**Utricularia vulgaris* L. Loch between Sligachan and Coruisk.
U. minor L. In flower at Sligachan.
Galeopsis speciosa Mill. Talisker.
Lamium molluccellifolium Fr. Sea-beach, Balmacara (v.-c. 105).
**L. hybridum* Vill. Garden ground, Fort William (v.-c. 97).
**Polygonum Raii* Bab. Beach, Glen Brittle! Not quite typical *Raii*, but seems a condensed state of that species. Rev. E. S. Marshall agrees.
Oxyria digyna Hill. Coolins.
Juniperus sibirica Burgs. Coolins.
Malaxis paludosa Sw. Sligachan.
**Luzula arcuata* Wahl. Ben Nevis (v.-c. 97), at an elevation of about 3250 ft.! A surprising addition to such a well-examined mountain as Ben Nevis. This scarce plant is now known to occur certainly in six Scottish vice-counties and doubtfully in two more, as under:—89. Perth E.? So recorded in Watson's Top. Bot., but Dr. F. B. White could find out no further details. 90. Forfar? Watson's Top. Bot. 92. Aberdeen S.! 94. Banff! 96. Easterness! 97. Westerness! 105. Ross W. A. H. Evans. 108. Sutherland W.!
L. spicata DC. Coolins.
**Potamogeton crispus* L. Loch near Sligachan.
Eriocaulon septangulare With. Loch, Sligachan; abundant!
Carex rigida Good. Coolins.
C. limosa L. Sligachan.
C. pallescens L. Loch Brittle.
Hymenophyllum peltatum Desv. Eagles Nest Chimney, Coolins.
Polystichum Lonchitis Roth. Coolins.
Phegopteris polypodioides Fée. Coolins.
Lycopodium Selago and *L. alpinum*. Coolins.

NOTES ON SOUTH KERRY PLANTS.

By H. Stuart Thompson.

During a short visit in July to Co. Kerry, with my friend Mr. Arnold Eliott, several observations were made which seem worth putting on record. On the summit of Carrantual (3414 ft. or 1041 metres), the highest mountain in Ireland, we found the following fifteen flowering plants, *viz.*:—*Saxifraga umbrosa*, *S. stellaris*, *Galium saxatile*, *Vaccinium Myrtillus*, *Armeria maritima*, *Thymus Serpyllum*, *Rumex Acetosa*, *R. Acetosella*, *Luzula maxima*, *Juncus trifidus*, *Carex rigida*, *Agrostis canina*, *Festuca ovina* and forma *vivipara*, *Sieglingia decumbens*, and *Deschampsia flexuosa*. Mr. F. N. Williams, in his interesting compilation on *The High Alpine Flora of Britain*, being a list of the flowering plants and ferns found at a thousand metres and upwards on the mountains of the British Isles, gives one or two more species of grasses from above one thousand metres on Carrantual, which is also called Carrantuohill and Carn Tual in *Cybele Hibernica*, but he does not record *Juncus trifidus* except from some Scotch summits, while *Thymus* and *Sieglingia* are entirely wanting in this list of one thousand metre plants. Slightly lower, at about 3000 ft., we got *Viola Riviniana*, *Saxifraga decipiens* Ehrh., *Sedum Rhodiola*, *Calluna*, and a *Euphrasia*; and *Salix herbacea* at 2700 ft. The rare *Saxifraga Sternbergii* was seen in very small quantity on two different slopes of the mountain at about 2500 ft.

The most startling find was *Hymenophyllum peltatum* at the very unusual height of 3000 ft., which Mr. Eliott discovered in trying to force a way over a buttress in descending the north-west *arête* but which we eventually forsook for a long and very stony gulley. My companion also found *Sisyrinchium angustifolium* by Lough Caragh, where it was associated with *Drosera*, *Lobelia Dortmanna*, and *Narthecium*. This North American species is (out of Ireland) unknown elsewhere in Europe except as an introduction; but Dr. Scully, who is preparing a book on the Flora of Co. Kerry, is more and more inclined to consider it indigenous here, and Mr. Lloyd Praeger is of the same opinion.

In one spot in the beautiful district of Caragh we saw *Cardamine amara*, which appears to be recorded only from six of the Northern Divisions of Ireland. Near Killarney, *Orobanche Hederæ* was parasitic upon Ivy. As South Kerry is formed of great folds of Lower Devonian slates and sandstones, some of whose anticlines run in great promontories far into the Atlantic, it is not surprising to find a number of plants rarely seen in Britain except in West Somerset, Devon, and Cornwall. Among the rarer species are *Sibthorpia europæa*, *Euphorbia hiberna*, *Bartsia viscosa*, and *Inula crithmoides*; while of commoner plants *Jasione montana* and *Cotyledon Umbilicus* may be mentioned as characteristic of both areas.

The Alpine Flora of the West of Ireland is interesting, partly because of the extraordinary way in which certain species, such as

Gentiana verna, *Dryas octopetala*, and *Saxifraga Sternbergii*, descend to sea level, particularly in Co. Clare. But those who are interested in such matters should get the well-illustrated and extremely useful *Tourists' Flora of the West of Ireland*, by Mr. Praeger, which has already been commended in this Journal (Journ. Bot. 1909, 281). It is a capital little book on ecology, and marvellously cheap at 3*s*. 6*d*.

THE BRUSSELS CONGRESSES.

The International Botanical Congress held at Brussels on May 14–22 was preceded by an International Horticultural Congress on April 30–May 3, which was attended by a large number of representatives, including delegates from the important Horticultural Societies. The meetings took place in the Salle des Fêtes in the grounds of the Great Exhibition, at that time in a very incomplete state. Among the various subjects discussed was that of horticultural nomenclature. While there has been a general desire on the part of the more scientific horticulturists to conform to the Rules of Botanical Nomenclature agreed upon at the International Botanical Congress at Vienna in 1905, it was felt that certain points of details which were not discussed at Vienna, but which were of special interest to horticulturists, should be definitely settled. The Congress was unanimous in agreeing to adopt the Vienna Rules of Nomenclature, with necessary additions in the case of horticultural varieties and hybrids. It was agreed that the names of horticultural varieties, expressed, in accordance with the Rules, in the vulgar tongue, must remain fixed when used in other languages than the one in which they were originally employed. When possible, the name should consist of a single word, and never of more than two, or at most three, words. To ensure valid publication, a description of the variety must be drawn up in Latin, English, French, German or Italian.

As regards garden hybrids, it was agreed that the specific name may be expressed in Latin or in a vulgar tongue in Roman characters; if possible, it should be a single word, but at any rate not more than three words. Various suggestions had been made as to the system of nomenclature for artificial hybrids in which two, three, or more genera were involved. In the case of bi-generic hybrids the custom was confirmed of forming a Latin generic name by the combination of the names of the parents; the specific name, also in Latin form, to be separated from the generic by the sign of hybridity, thus, *Læliocattleya* × *Smithii*. For pluri-generic hybrids the recommendation of the Royal Horticultural Society of London was adopted, namely, the use of a conventional generic name, derived from that of some person of distinction, with the termination *ara*.

At the Botanical Congress, the important subjects of deliberation were further consideration of the rules of systematic

nomenclature and a series of propositions on phytogeographical nomenclature. The rules of systematic nomenclature which were drawn up as the result of the deliberations of the Vienna Congress in 1905 left open for future discussion special points in relation to non-vascular cryptogams and palæobotany.

After some informal discussion a series of recommendations was agreed to by the Congress. The date 1753 was accepted as the starting-point for the Mycetozoa, Algæ (excepting certain groups to be noted below), Characeæ, Sphagnaceæ, Hepaticæ, and Lichens. The exceptions to the general rule for Algæ were as follows:—Desmids, to start from J. Ralfs, *British Desmidieæ*, 1848; Oedogoniaceæ, to start from K. E. Hirn, *Monographie u. Iconographie der Oedogoniaceæ*, 1900; Nostocaceæ, to start from M. Gomont, *Nostocacées homocystées*, 1890, and E. Bornet and Flahault, *Nostocacées hétérocystées*, 1886-8. For the Fungi, Fries's *Systema Mycologicum*, 1821–32, was adopted as the point of departure, excepting for the Uredineæ, Ustilagineæ, and Gasteromycetes, which it was agreed should date from Persoon's *Synopsis*, 1801. For Mosses, Hedwig's *Species Muscorum*, 1801, was agreed upon. In order to reduce to a minimum changes of names which would result in cases where an early date was adopted as a starting-point, special committees were appointed for each of the large groups to draw up lists of *nomina conservanda*, or names of genera which, from long-established use, should be retained, though inadmissible on grounds of strict priority. These lists will be put before the next Congress, which is to be held in London in 1915; in the meantime, workers are recommended to make as few changes as possible from generally accepted nomenclature. The discussion of a starting-point for the nomenclature of Bacteria, and of the Schizophyceæ, excepting the Nostocaceæ, was postponed until the next Congress of 1915.

A useful decision was arrived at in connection with the names of pleomorphic fungi, the successive states of which have been described under different names. It was agreed that these should bear one generic and specific name—*viz.* the earliest given to the state, which it is agreed to call the perfect state—on condition that this name otherwise conforms to the Rules. The "perfect state" is that which leads up to the ascus in the Ascomycetes, the basidium in the Basidiomycetes, the teleutospore in the Uredineæ, and the spore in the Ustilagineæ. The addition of figures, including microscopic details, was recommended when describing new genera or species of fungi.

Some discussion took place on the subject of still-born names, that is, species-names taken from an earlier combination which is contrary to the Rules and therefore not valid (see also this Journal, 1909, 187). The Committee made the following recommendation, which was accepted:—A name which has to be rejected or changed is to be replaced by the earliest valid name; if there is no earlier valid name, the author creates a new one, and in so doing he is at liberty to adopt a species-name from some earlier non-valid combination.

In palæobotany some difficulty has arisen from the use of the same genus name for recent and fossil plants. As this is against the Rules, the name of the recent or fossil plant must be changed. In order to reduce to a minimum changes of name resulting from this cause, it was agreed to draw up a double list of generic names which are to be retained:—(1) a list of the generic names of living plants, duly published and in general use, which enter into competition with earlier names of fossil genera, such as *Bucklandia*; (2) a similar list of generic names of fossil plants which compete with earlier names of living plants since relegated to synonymy, in order to avoid the future use of such names for the living plant. In the former case the name of the living plant takes precedence, in the latter that of the fossil.

The palæobotanists showed some disinclination to fall into line with workers in descriptive botany generally in making use of a Latin diagnosis when describing new genera or species. It was, however, pointed out that a diagnosis, giving merely the important characters of the fossil in question, was required, and not a complete description; and, further, that such a diagnosis rendered the form in question far more widely intelligible than a description in a vulgar tongue. Those members who were present at Vienna in 1905 called to mind the difficulty experienced when attempting to limit the number and variety of vulgar tongues which should be admissible for the diagnosis of novelties. It was agreed that a Latin diagnosis should be given, with the recommendation to the author to add a full description in a vulgar tongue.

The last matter for discussion was the proposition to add to the list of *nomina conservanda* for seed-plants. The original list, which was agreed to by the Vienna Congress, was admittedly incomplete, but as it had been accepted and used for five years many botanists were disinclined to amend it. A list of additions had been proposed which, if accepted, would have upset again changes which had been made since 1905 in conformity with the Rules. On the other hand, the list contained names of large and important genera, such as *Persea*, which could only be retained if included in a list of *nomina conservanda*—on strict grounds of priority, they are inadmissible. It was decided to remove from the proposed list of additions those names of genera the inclusion of which would be subversive of changes already made, and with this important alteration the additions to the original list were agreed upon.

The Vienna Congress had also appointed a commission of eminent plant-geographers to draw up recommendations for phytogeographical nomenclature. The reporters of the commission, Profs. Flahault and Schroeter, drew up a report embodying their own views and those of other workers upon various aspects of the question, and also a series of recommendations based on the consideration of the views and suggestions put forward. These recommendations were accepted by a large majority of the commission, and formed the subject of debate at the Congress. It

was recognised that the Congress should not attempt to pass laws or rules, but merely recommendations supported by reasoned annotations. It became evident, however, that a general agreement on the recommendations as a whole was not likely to be reached, and the reporters therefore decided to put before the Congress only those recommendations upon which there appeared to be substantial agreement. The substance of these was as follows:—

(1) That every author should explain exactly what he understands by the terms he uses.

(2) That the popular names of the units of vegetation in the various languages should be retained.

(3) That the principle of priority in phytogeographical terminology is inadmissible.

(4) That a polyglot synonymic dictionary of phytogeographical terminology, with bibliographical references, should be compiled by a special commission.

(5) That the colour scheme suggested by Prof. Engler for maps of tropical vegetation be recommended for adoption.

(6) That ecological phytogeography may be defined as the study of the relationships of plants and plant-communities with their environment.

These recommendations were carried *nem. con.* As regards the somewhat contentious question as to the meaning and definition of the two terms *plant-association* and *plant-formation* which have come into use to designate the most important units of vegetation, Prof. Flahault stated that there appeared to be general agreement in considering the *association* as a unit of definite floristic composition and the *formation* as something different from the association.

Though it has not resulted in the establishment of a uniform system, the work of the commission has been of the greatest use in forcing workers to think about the concepts and terms they employ and in promoting international exchange of views; the promised synonymic dictionary will be invaluable.

We are indebted to *Nature* of June 30 for a portion of the information given above.

THE "BIOGRAPHICAL INDEX OF BRITISH BOTANISTS."

In accordance with an intimation given in these pages some time back, a new edition of this Index, to the usefulness of which ample testimony has been borne, is in active preparation. It will of course embody all the Supplements and will be brought down to the close of the present year. The very numerous additional details which have accumulated during the fifteen years which have elapsed since the *Index* was published will, of course, be incorporated, and it is hoped that the readers of the Journal will communicate to the compilers any details which are not found in the work or in its Supplements. We have already received infor-

mation as to two of those entered in the *Index*, of whom little but the name is there given, and this we may as well place on record in a fuller form than the plan of the *Index* will allow. For that of John Williams we are indebted to his son, the Rev. John Williams, M.A., of Llanwddyn Vicarage, Oswestry; for that of Holbech (misprinted "Holbeach" in the *Index*) to our contributor Mr. W. A. Clarke.

John Williams (1801–1859).

"He was born March 1, 1801, at Llansantffraid Glan Conwy, being the son of Cadwaladr Williams, corn miller, and Jane his wife. His death took place at Mold, Flintshire, on Nov. 1, 1859. He was educated at Harrington Academy, Liverpool, and at the beginning of 1819 he went to Betley Hall Gardens for about two years, after which he worked for four years at Ashridge, and for three more at Kew and Chelsea Botanic Gardens. In May, 1827, he left London for Abergele, in which neighbourhood he had two brothers in the medical profession. In May, 1832, on leaving the Royal College of Surgeons, Dublin, he settled down at Corwen, where for eighteen years he had a wide practice, which in 1850 he sold in order to go to the gold diggings in California, where gold had a little before that date been discovered. Having there lost his health through several attacks of malaria, he returned to this country, graduated M.D. at St. Andrews in 1858, and practised at Wrexham almost until the time of his death.

"During his botanical work and study he collected and gave the scientific name to from five to six thousand species of grasses, mosses, and flowering plants, and in 1830 his *Faunula Grustensis* was published, giving (in Latin, English, and Welsh) the fauna and flora found by him in the parish of Llanrwst (where he and one of his medical brothers then lived). (I may explain that 'Grustensis' is the adjectival form of the name of the Patron Saint of the parish church of Llan*rwst*, which is St. *Grwst*.) Long anxious to secure a safe home for the collection (which had travelled much with him to America, &c.), I gave it in 1902 to the Agricultural Department of the University College, Bangor, with a copy of the *Faunula*. I also gave to the same department the essay sent by him in the forties to the Royal Agricultural Society on *The Food of Plants*. In acknowledging this essay the professor said that it was particularly valuable as showing what was then known on a subject which at that period was little studied."

Rev. Charles Holbech (1782–1837).

He was born May 14, 1782, at Farnborough, Warwickshire, of which place his great-nephew, who supplied Mr. Clarke with some of his information, is now vicar. He matriculated at Christ Church, Oxford, 28 Jan. 1801, and took his B.A. degree in 1804, proceeding to M.A. in 1808; in 1812 he became Vicar of Farnborough, in which position he remained until his death in 1837.

He is described as "a quiet, country-loving man," but it does not appear that he in any way distinguished himself as a botanist; his name, indeed, is only associated with the addition of *Linosyris* to the British Flora in 1812 (see Eng. Bot. t. 2505).

The pedigree of his family will be found in Burke's *Landed Gentry* (ed. 5, p. 634).

SHORT NOTES.

Berkshire Plants.—Hardly had the last note on the Berkshire Flora been penned when the pleasing intelligence came to me that my friend Mr. C. P. Hurst had discovered *Chrysosplenium alternifolium* L. in a wood near Gibbet Hill, in district 4 Kennet, a very interesting addition to our flora. In July, Mr. J. R. W. B. Tomlin, of Reading, sent me a plant to determine, which he found on a common between Aldermaston and Newbury; this proved to be *Campanula persicifolia*. I therefore went over to see under what conditions it grew. The common is a large one, and in one place has a considerable quantity of *Euphorbia Cyparissias*; this grows on the northern side, but spreads for some distance from the road. There is no cottage on the common or sign of cultivation, and I am told within remembrance there has been no habitation on the place. I found the *Campanula* in some quantity, but not, as I expected, growing with the *Euphorbia*, but quite away from it, among the furze-bushes. It made a pretty sight to see the somewhat conspicuous flowers growing out of the loose bushes of furze. Were it not for the presence of the *Euphorbia*, I should have considered the plant to be native; as it is, this locality is of special interest as showing it in a completely naturalized, if not indigenous, condition. I may also add that I have found †*Lappula echinata* Gilib. at Cothill, *Thymus ovatus* Miller and var. *alba* on Brimpton Common, *Glyceria distans* Wahl. abundantly on the racecourse at Abingdon, *Carex strigosa* Huds. by the Loddon near Sandford Bridge, and, in company with Mr. Britten, *Cirsium eriophorum* Scop. in great quantity on the hillside above Newbridge on the Berkshire side of the Thames.—G. Claridge Druce.

Saxifraga Geum × serratifolia (p. 202).—Not having sent Mr. Bickham any plant under this name, I asked him to return me a root; this I divided, and it is now flourishing in my garden. After careful examination, I believe it to be very near indeed to the usual Irish form of *S. Geum* (var. *serrata* Syme), possibly crossed with the subspecies *S. hirsuta*, which I do not consider to be a hybrid. From the same locality I have in cultivation *S. Geum*, var. *serrata* × *umbrosa*, var. (vel. subsp.) *punctata*, which is very different—much dwarfer and more compact; leaves orbicular-cordate, smaller, flatter, more coriaceous, with a much shorter, broader, flattened petiole.

Colchicum autumnale L. (p. 203).—I must emphatically

dissent from Messrs. Drummond and Jackson's suggestion that this was "originally introduced" into Britain. In its usual station (meadows) I never saw any reason to distrust its native status; and I have found it in woods or copses in at least four vice-counties, *viz.* N. and S. Somerset, N. Wilts, and W. Suffolk. The form with white flowers I have not met with; but it is most likely an albino, such as occurs in many species with normally blue, purple, or red flowers.—EDWARD S. MARSHALL.

[Mr. Druce in Bot. Exch. Club Report for 1909, p. 419, supports Mr. Marshall's view as to *Colchicum*, in which we also concur.—ED. JOURN. BOT.]

LATHYRUS TUBEROSUS IN KENT.—Mr. Miller Christy in his interesting paper (pp. 170–177) makes no reference to the occurrence of this plant in Kent. In the *Report and Transactions* of the East Kent Scientific and Natural History Society for 1906, p. 16, I have recorded it from Elms Vale, near Dover. The place where I found it is nearly two miles from Dover harbour, and a mile and a quarter from the sea, with high cliffs intervening. It is thus neither a ballast-heap plant nor a garden escape; for the cottage nearest to the place where it occurs is nearly a quarter of a mile off, and is at the bottom of the valley. This plant is found some two hundred feet higher, near the top of the downs and far removed from a public road. It grows in the middle of a field which has been in grass for many years. It must however be stated that three other plants which can only be here regarded as aliens, namely, *Salvia verticillata*, *Coronilla varia*, and *Euphorbia Esula* are found here, and about half a mile off *Euphorbia Cyparissias*.—JOHN TAYLOR.

PELORIA STATE IN FOXGLOVE.—One of the most characteristic plants of the neighbourhood of High Legh, in Cheshire, is *Digitalis purpurea*, which, in almost every hedge, adorns a county that from its flatness, high state of cultivation, and strictly fenced-in and preserved parks and woods, presents little of interest to a lover of wild plants. A large number of the spikes of flowers of Foxglove in High Legh Park had a very remarkable divergence from the ordinary appearance, owing to the terminal flower being perfectly campanulate and very large, the other flowers of the spike being of the ordinary size and shape. The calyx segments and the stamens are more numerous, twice as many at least as in the normal flower, and the corolla is regularly convexly scalloped or wavy at its edge. I did not observe this peculiar condition in any of the Foxgloves outside the Park, but I ascertained that plants bearing these peloriate flowers had been observed in the Park in previous years. Boswell Syme, in his description of the genus *Digitalis*, says, "Corolla tubular or campanulate," but I am not aware of any species of the genus in which the corolla is campanulate. The Foxglove is included in the list, given by Masters in his *Vegetable Teratology*, of plants in which regular peloria has been observed.—FREDC. STRATTON.

DISTRIBUTION OF THE HOLLY.—This tree is now recorded for all the British counties except Huntingdonshire, Caithness, Orkney, and Shetland. Somewhat doubtful of its absence from even one English county, I inquired of Mr. E. W. Hunnybun, long resident in the district, who kindly gave the following information:—"I have never found the Holly in this county, even in a naturalized situation. The late Mr. W. R. Linton, who botanized very much in this county, never found it."—FREDERIC N. WILLIAMS.

EUPHRASIA MINIMA IN NORTH DEVON.—On August 13th last, in company with Mr. R. Taylor, of Bishop's Tawton, Barnstaple, I met with specimens of this interesting plant growing in the parish of High Bray, at altitudes between 440 and 460 metres; they ranged in height from 4 to 14 cm., and their stems were in some cases simple and in others more or less branched.—W. P. HIERN.

JUNCUS TENUIS IN HANTS.—I found this plant on the Southampton Common on July 31: the first record for Hants, I believe.—J. F. RAYNER.

REVIEWS.

Prodromus Floræ Britannicæ. By FREDERIC N. WILLIAMS. Part 7. Pp. 363–458. June, 1910. Price 4*s.* 6*d.*, post free. 110, High Street, Brentford: G. Stutter.

IN this, just as in the previous parts, British botanists will find much to interest them and not a little to learn. Ninety-two additional species are described, bringing up the number dealt with to 464, distributed among 145 genera, and belonging to 27 families of plants. With the next part the *Sympetalæ* will be concluded.

The account of the genus *Plantago*, which was begun in the sixth part, is now ended; two species, allied to *P. Coronopus* L., are novel names to British Floras, namely, *P. Serraria* L., and *P. macrorrhiza* Poir., both Mediterranean plants. The former of these two species is admitted to our Flora on a specimen from the Island of Steep Holmes, in the Bristol Channel, off the coast of Somerset. The latter species is recorded from the sea-beach at Charmouth and from Poole Harbour in Dorset; also from Blackpool in Lancashire. It might perhaps have been mentioned that the plate of this plant which appeared in the *Proceedings of the Dorset Nat. Hist. Club*, where it was described by Mr. E. G. Baker as *P. Coronopus* var. *ceratophyllon*, was reproduced in this Journal for 1897, t. 371, p. 357.

About half of part 7 is taken up with the account of the family *Lamiaceæ*, which contains 48 species, distributed among 19 genera.

The Mints are treated in a masterly manner, and in accordance with recent researches. "In England, as in France and Germany, there are five well-defined species of *Mentha*. Of these, in *M. pulegium* alone has it not yet been demonstrated that it forms hybrids with any of the other four species. *M. aquatica*, *M. arvensis*, *M. rotundifolia*, and *M. silvestris* all hybridize among themselves, and form blends which present difficulties to the study of the many forms which are met with. The indefinite tendency to hybridation among Mints, both in the wild state and under cultivation, is a factor in variation that has only been tardily recognised." At the close of important critical remarks there is compiled an alphabetical list of synonyms and hybrid-names, entirely as they apply to the names which are found to occur in British Lists, without references, but giving in all cases the date. There are 83 of such names.

In Engler's *Die Natürlichen Pflanzenfamilien*, iv. Teil, 3 Abt. *a* (1896), Dr. J. Briquet in his revision of *Labiatæ* reduced the genera *Clinopodium* L. and *Calamintha* Moench to *Satureia* L., treating them as sections of the latter; this reduction has been adopted by Mr. Williams. Thus there are five species with names strange to British botanists, namely, *Satureia vulgaris* Fritsch (*Clinopodium vulgare* L., *Calamintha Clinopodium* Spenn.), *S. Acinos* Scheele (*Thymus Acinos* L., *Calamintha Acinos* Clairv., *Clinopodium Acinos* Kuntze), *S. Nepeta* Scheele (*Melissa Nepeta* L., *Calamintha Nepeta* Savi, *Clinopodium Nepeta* Kuntze), *S. Calamintha* Scheele (*Melissa Calamintha* L., *Calamintha officinalis* Moench, *Clinopodium Calamintha* Kuntze), and *S. grandiflora* Scheele (*Melissa grandiflora* L., *Calamintha grandiflora* Moench, *Clinopodium grandiflorum* Kuntze, *Calamintha sylvatica* Bromf.). The reasons for the union of these genera are explained by Briquet in the place referred to.

For the genus of the common Self-heal, *Prunella vulgaris* L. Sp. Pl. ed. i. p. 600 (1753), Mr. Williams adopts the ancient form of the name, *Brunella*. He writes: "Sticklers for the more procrustean section of the Vienna recommendations have uniformly overlooked the fact that Linnæus did not describe the genus 'Prunella' until 1764, *Gen. Plant.* ed. 6, p. 301, n. 735. In all previous editions Linnæus had described the genus as *Brunella*." This statement must be qualified; for Linnæus, in the fifth edition of his *Genera Plantarum*, published in 1754, though on page 261, n. 654, he gave "BRUNELLA *Tournef.* 84," with a description; yet in the appendix of the same on page 500, among errata, he altered *Brunella*, p. 261, to read *Prunella*. Mr. Williams adds, "Linnæus was not justified in altering the name in his later work, as he was evidently unaware of the derivation of the word, which, as Bauhin points out in his *Pinax*, p. 260 (1623), is from the German 'Brüne,' the name of a herb used in affections of the tongue and palate. As Hill had already, however, again defined *Brunella* (in 1760), as cited above [*Fl. Britannica*, p. 309], the definition of 'Prunella' by Linnæus four years later does not count." Against this contention it may be noted that Hill, in his *British Herbal*,

p. 362 (1756), gave and described *Prunella*. On the other hand, it should in fairness be disclosed that Philip Miller, in the fourth edition of his abridged *Gardeners' Dictionary*, in 1754, gave and characterized *Brunella*. In this connection, Recommendation xxx. of the International Rules for Botanical Nomenclature, of 1905, seems appropriate: "The liberty of making orthographic corrections must be used with reserve, especially if the change affects the first syllable, and above all the first letter, of a name."

In *Primulaceæ* Mr. Williams has paid great attention to the differences to be found among the field Pimpernels, of which he gives three species, namely, *Anagallis arvensis* L., *A. femina* Mill., and *A. latifolia* L. The two first have stems procumbent or towards the apex slightly ascending, and the third has erect stems. In *A. arvensis* the colour of the corolla is mostly scarlet but patched with crimson at the base, rarely white and similarly patched, sometimes also variously coloured, but never blue; the lobes are broadly ovate-rotund, entire and glandular-ciliate. In *A. femina* the corolla is blue with the lobes oblong, narrowed towards the apex, and denticulate or irregularly serrulate along the middle part of the edge, not fimbriate-ciliate. In *A. latifolia* the lobes of the blue corolla are more finely serrulate than in the latter species, and the leaves are more broadly ovate than in the other two species.

"Continental botanists regard the plant with flesh-coloured flowers, *A. carnea* Schrank, as an hybrid. The few English plant-lists that mention it include it as a colour-variation of *A. arvensis* . . . . Those who assert the hybrid origin of *A. carnea* derive it from *A. arvensis* and *A. femina*, both of them procumbent plants. Now *A. latifolia* and *A. carnea* are erect in habit. It is contrary to Mendelian principles that the blend of two procumbent plants should be erect. I believe therefore that *A. carnea* is the hybrid product not of *A. arvensis* and *A. femina* but of *A. arvensis* and *A. latifolia*, being exactly intermediate in character between these two. *A. carnea* has broader leaves than either *A. arvensis* or *A. femina*, but not so broad as those of *A. latifolia*."

In *Plumbaginaceæ*, the generic name *Limonium* is regularly taken for the Sea-Lavenders, the first species of which is by an oversight printed *L. vulgaris* instead of *L. vulgare*. *Limonium* was adopted by Miller in 1754, Gard. Dict. abridged, ed. iv. In the same edition Miller properly adopted *Statice* L. to include Thrift, which Mr. Williams calls *Armeria maritima* Willd. *A. vulgaris* var. *planifolia* Syme, Engl. Bot. vii. p. 57, t. 1153 (1867) "may be left out of consideration as altogether unsatisfactory. It was described and figured from a plant cultivated in Watson's garden, brought south from somewhere in the Scottish Highlands, and obviously modified under cultivation and change of habitat and soil, and thus lacking the importance it might have had if it had been compared with the plant growing in its natural home." *A. alpina* Willd. is given and diagnosed for a plant occurring in Teesdale, the English Lake District, N. Wales, the Scottish Highlands, and Kerry.

The genus *Vaccinium* and its allies are separated from the Heath family; this separation was adopted by Sir Joseph Hooker in Benth. & Hook. f. Gen. Pl. pp. 564, 577 (1876), but Mr. Williams uses for the name of the former family, *Siphonandraceæ* Klotzsch (1851), instead of the more familiar name *Vacciniaceæ* Lindl. (1836). The Cowberry he calls *V. punctatum* Lamk. (1778), instead of *V. Vitis-Idæa* L. (1753). By way of explanation he writes:—"It is impossible to keep up the Linnean name for this shrub, which was adopted from Tournefort, as it is not only inept and inappropriate, but, what is worse, a geographical blunder. As M. Rouy points out, Fl. de France, x. p. 98, this is a boreal species, which grows neither in the region of Mt. Ida in Crete, nor in the region of Mt. Ida of the Troad. Further, the shrub in no way resembles a Vine, and leastwise that of Mt. Ida, which was a name applied by the ancients to several plants totally different, and which included also *Amelanchier vulgaris* and *Vaccinium oxycoccus*, but which certainly did not include the Cowberry. The Linnean name therefore connotes a threefold blunder,—historical, geographical, and descriptive; and should pass into the limbo of synonymy." The change, however, is of course not in accordance with the Vienna Rules.

Two or three small slips may be mentioned. The transcript of Lightfoot's MS. account of his botanical tour in Wales is not by Solander (p. 363) but by Sigismund Bacstrom; Lightfoot's herbarium is not "now at Kew" (p. 393), nor is there any specimen of *Leonurus* from him in the Kew Herbarium: Mr. Williams has evidently overlooked the account of Lightfoot's plants in this Journal for 1905, p. 291. Under *Salvia Verbenaca* we should have expected to find some reference to *S. Marquandii* Druce (Journ. Bot. 1906, 405, t. 483) and to Messrs. Pugsley's & Druce's papers on the forms of the species. We do not understand the statement that "Linnæus and all who have followed him have written 'Glecoma hederacea'" (p. 406), but Mr. Williams is no doubt right in pointing out that the generic name is neuter, and that the trivial should therefore be written *hederaceum*. Small matters like these do not however detract from the value of the book.

The next part will complete the first of the three volumes needed before the completion of the *Prodromus Floræ Britannicæ*. British botanists especially cannot fail to hope that the ominous indication, "The author is somewhat doubtful of completing the scheme planned out," will not be realized, for good work is not very common, and in any case loses very much of its value if left unfinished.

W. P. H.

Diseases of Cultivated Plants and Trees. By GEORGE MASSEE. London: Duckworth & Co. Pp. xii., 602, 171 figs. 7s. 6d net.

THE volume before us is intended to supersede the author's previously published book on Plant Diseases, the issue of which is exhausted; and a fuller treatment of the subject was urgently

needed. We hear on all sides of the necessity for improved scientific methods of agriculture, for the better understanding of plant-life and of the conditions necessary to secure the best results. With advancing physiology must go its attendant pathology. The laws of health but indicate the course to pursue to avoid anything that would hinder the fullest development; and hindrances all come under the scope of pathology. The agriculturist must be ready to act promptly on the first appearance of disease in his plants; he must work with both sword and trowel in hand.

A glance at the "Contents" indicates the scheme and purport of the book. The author first discusses in a general way the cause of disease in plants, the occurrence of epidemics, and the way in which infection spreads. He touches on non-infectious troubles such as wounds, injuries caused by frost and hail, by smoke and acid fumes in the atmosphere, and by the conditions of the soil. He then describes the methods and material employed for checking or destroying infectious diseases, and thus arrives at the subject of fungi, the chief cause of disease in plants, as many of them are parasites on living plants and cause more or less injury to their host. By far the larger portion of the text-book is occupied by a detailed description of the parasites and of the harm they do. They are arranged according to the classification of fungi generally accepted, so that, in each section, we learn of all the cases of disease ascribed to each class of fungi. A full list of host-plants serves as a further guide to the often bewildered student.

The book is more than a compendium of the plant-diseases occurring in all parts of the world. Mr. Massee brings his own judgment to bear on many of the statements made: he does not accept Professor Percival's account of Silver leaf disease on Plum trees, and he rejects as totally impracticable the attempt to destroy insect pests by infecting them with parasitic fungi. On the other hand, he quite approves of the destruction of voles by means of a virus. The advice Mr. Massee gives is full of practical wisdom and common sense: it may be to destroy a hopelessly diseased crop; to gather and destroy dead branches that carry on the mischief; to attend to the leaf-mould used in potting, or to try and save the plants by washing and spraying with fungicides. He always draws on his own great experience and sound observation.

The question as to the increase of plant disease, so often alleged in recent years, is also touched on. Mr. Massee finds that it is impossible to come to any definite conclusion on the matter. One aspect of the subject is again and again emphasized: that most of our epidemics are due to unnatural conditions and forced cultures. He remarks on the virulent Cucumber disease, *Cercospora melonis*:—"This epidemic may, in a sense, be looked upon as an artificial creation, inasmuch as it can only extend at a rapid rate under the modern conditions of culture." And again under *C. violæ*, which attacks violet leaves, he says:—"When the

plants are grown in the open air the disease is rare, and never assumes the proportions of an epidemic." A short account is added of diseases caused by animals.

In this volume on Plant Diseases Mr. Massee has included all that is of interest in the subject and of value to the plant cultivator, to whom such a book will be most helpful; to the mycologist it will be indispensable.

A. L. S.

BOOK-NOTES, NEWS, &c.

The monument which is being erected by public subscription at Forfar in memory of George Don will be unveiled on September 8th by Mr. G. Claridge Druce, who has been largely concerned in securing its erection.

We learn from the *Selborne Magazine* that a reservation for alpine flora and fauna is being made in Switzerland. A small band of naturalists and botanists have devoted themselves to this work of preservation and have succeeded in setting aside as a National Park the wild and beautiful valley of Cluoza in the Engadine. This valley, situated at the foot of the lofty Piz Quatervals and surrounded by natural walls of rock, will have nothing to fear henceforth from civilization in the shape of railways, monster hotels and factories. Here, too, the extermination of wild flowers will be strictly prohibited, and the chamois and even perhaps the bear will roam unmolested. The land belongs to the parish of Zernetz, and in order to cover the cost of the lease, a fund is being raised. All contributions towards it from England will be gladly received at the office of the Bund für Naturschutz, 22, Spitalstrasse, Basel, Switzerland.

A Manual of Botany for Indian Forest Students, by Mr. R. S. Hole, F.L.S., has lately been issued from the Calcutta Government Press. In this work, the author, who holds the post of Forest Botanist in the Imperial Forest School, Dehra Dun, has provided a text-book designed primarily for the use of his pupils in that institution, and he is to be congratulated on having produced a volume which is admirably adapted to the purpose in view. The style is concise and lucid, and the matter is well selected and quite abreast of present-day botanical knowledge. We may be permitted to suggest, however, that the section of the Manual dealing with systematic botany, while well fitted to give the student an adequate grasp of general principles, appears to us to leave him somewhat short of the point at which he would be qualified to employ to the best advantage the *Flora of British India* or the regional Indian floras based upon it, to which, when he has left the Forest School, he will have frequent occasion to refer. The scope of the work in this direction would be materially widened by the inclusion of a concise synopsis of the natural families of plants occurring in British India, which would serve as a useful stepping-stone from the concrete to the abstract.

DEMY 8VO, PRICE 1S. 6D.

Key to Genera & Species of British Mosses

BY THE REV. H. G. JAMESON, M.A.

PRICE 2S. 6D., POSTAGE 2D.

The Subsection Eu-caninæ of the Genus Rosa

BY MAJOR A. H. WOLLEY-DOD.

LIMP CLOTH, 8VO. PP. 276. PRICE 6S. NET. POSTAGE 3D.

NOTES ON THE

Drawings for Sowerby's 'English Botany.'

BY F. N. A. GARRY.

DEMY 8VO, 118 PP., PRICE 3S.

A Supplement to Topographical Botany, Ed. 2.

BY ARTHUR BENNETT, F.L.S.

PP. 32, WITH 2 PLATES, IN PAPER COVER. PRICE 2S., POSTAGE 1D.

THE BRITISH PANSIES.

BY E. DRABBLE, D.Sc., F.L.S.

PP. 24, IN PAPER COVER. PRICE 1S., POSTAGE 1D.

LINNÆUS'S FLORA ANGLICA.

DEMY 8VO, 44 PP., PRICE 1S., POSTAGE 1D.

INDEX ABECEDARIUS,

AN ALPHABETICAL INDEX TO THE FIRST EDITION OF THE 'SPECIES PLANTARUM' OF LINNÆUS.

COMPILED BY WILLIAM PHILIP HIERN, F.R.S.

PP. 88, IN PAPER COVER, PRICE 2S. 6D., POSTAGE 2D.

A

FLORA of GLAMORGANSHIRE

BY H. J. RIDDELSDELL, M.A.

London: WEST, NEWMAN & CO., 54, Hatton Garden, E.C.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of June and July (Double Number).—The Inter-Relationships of the Bryophyta. III.—Anacrogynous Jungermanniales. Inter-Relationships of the Anacrogynæ. (Figs. 30–43), by F. Cavers. Adventitious Budding and Branching in *Cycas*. (Text-Figs. 8–14), by M. C. Stopes. The Rhizophore of *Selaginella*. (Text-Figs. 15, 16), by W. C. Worsdell. Note on a Wounded Myeloxylon. (Text-Figs. 17, 18a, 18b), by H. S. Holden. Two Embryo-Sac Mother-Cells in the Ovule of *Fritillaria*. (Text-Fig. 19), by A. E. Lechmere. The Brussels Congress of Botanists. *Review.*—Seeward's Fossil Plants, by D. H. S.

Subscription-Price. 15*s.* *per annum (ten numbers) post free.*
Price of single number, 2*s.* *Price of double number,* 4*s.*

Published Monthly by the Editor, The Botany School, Cambridge.

Journal of Botany Reprints.

Bound separately in Paper Cover. Price 1s. 6d. Postage 1d.

THIRD SUPPLEMENT

TO THE

BIOGRAPHICAL INDEX OF BRITISH & IRISH BOTANISTS.

254 pp., Demy 8vo, Cloth extra, Price 9s. 6d. net.

BIOGRAPHICAL INDEX

OF

DECEASED BRITISH & IRISH BOTANISTS.

BY

JAMES BRITTEN, K.S.G., F.L.S., & G. S. BOULGER, F.L.S.

BOUND UP TOGETHER WITH

FIRST (1893–97) & SECOND (1898–1902) SUPPLEMENTS.

The Supplements can also be had separately, price 1 6 each ; postage 1d.

Demy 8vo, 23 pp., Price 1s., Postage 1d.

INTERNATIONAL RULES

FOR

BOTANICAL NOMENCLATURE

ADOPTED BY THE INTERNATIONAL BOTANICAL CONGRESS HELD AT VIENNA, 1905.

London: WEST, NEWMAN & *Co.*, 54, *Hatton Garden.*

Subscriptions to the Journal of Botany (16s. post free) for 1910 should be sent to West, Newman & Co.

No. 574 OCTOBER, 1910 Vol. XLVIII

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

The Study of the British Flora. By James W. H. Trail, M.A., M.D., F.R.S. 241

Alabastra Diversa.—Part XIX. By Spencer le M. Moore, B.Sc., F.L.S. 250

Short Notes.—Sibthorp's Lincolnshire Plants—*Goodyera repens* in Norfolk—*Geranium Endresi* Gay—*Juncus tenuis* Willd.—Durham Plants—*Maluxis paludosa* in Cornwall—*Juncoides pallescens* O. Kuntze in Surrey—*Rosa pimpinellifolia* L. × *rubiginosa* L.—*Herniaria hirsuta* in Cornwall 257

PAGE

Reviews:—

Edible and Poisonous Fungi .. 261

True & False Mushrooms; being a Guide to Mr. Worthington Smith's Drawings of Field and Cultivated Mushrooms and Poisonous or Worthless Fungi often mistaken for Mushrooms exhibited in the Department of Botany, British Museum (Natural History) 261

Supplement.—The British Roses. By Major A. H. Wolley-Dod (concluded).

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had price 1s. 6d. each.

AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

2 pages	25 copies	4s.	4 pages	25 copies	5s.	8 pages	25 copies	8s. 0d.
,,	50 ,,	5s.	,,	50 ,,	6s.	,,	50 ,,	9s. 0d.
,,	100 ,,	7s.	,,	100 ,,	8s.	,,	100 ,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles. Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

THE STUDY OF THE BRITISH FLORA.

By James W. H. Trail, M.A., M.D., F.R.S.*

The honour conferred in the election to be President for the year of the Botanical Section of the British Association imposes the duty of preparing an address. I trust that my selection of a subject will not be attributed by anyone to a want of appreciation of the worth and importance of certain sides of botanical research to which I shall have less occasion to refer. These have been eloquently supported by former Presidents, and I take this opportunity to express the thanks I owe for the benefit received from their contributions to the advancement of the science of botany. They have told us of the advance in departments of which they could speak as leaders in research, and I do not venture to follow in their steps. My subject is from a field in which I have often experienced the hindrances of which I shall have to speak, both in personal work and still more as a teacher of students, familiar with the many difficulties that impede the path of those who would gladly give of their best, but find the difficulties for a time almost insurmountable, and who are too frequently unable to spare the time or labour to allow of their undertaking scientific investigations that they might well accomplish, and in which they would find keen pleasure under other conditions. Those whose tastes lie in the direction of studying plants in the field rather than in the laboratory are apt to find themselves hampered seriously if they seek to become acquainted with the plants of their own vicinity; and, if they wish to undertake investigations in the hope of doing what they can to advance botanical science, they may find it scarcely possible to ascertain what has been already done and recorded by others.

For a time the knowledge of plants was too much confined to the ability to name them according to the system in vogue and to a knowledge of their uses, real or imagined. The undue importance attached to this side of the study, even by so great a leader as Linnæus, naturally led to a reaction as the value of other aspects of botany came to be realized, and as improvements in the instruments and methods of research opened up new fields of study. The science has gained much by the reaction; but there is danger of swinging to the other extreme and of failing to recognize the need to become well acquainted with plants in their natural surroundings. The opportunities for study in the laboratory are so great and so much more under control, and the materials are so abundant and of so much interest, that there is for many botanists a temptation to limit themselves to such work, or at least to regard work in the field as subordinate to it and of little value. It is scarcely necessary to point out that each side is insufficient alone. Yet some find more pleasure in the one side,

---

* Presidential Address to the Botanical Section of the British Association delivered at Sheffield, September, 1910.

and do well to make it their chief study; while they should recognize the value of the other also, and learn from it.

It is especially on behalf of the work in the field that I now wish to plead. There are few paths more likely to prove attractive to most students. The study of the plants in their natural environments will lead to an understanding of their nature as living beings, of their relations to one another and to other environments, of the stimuli to which they respond, and of the struggle for existence that results in the survival of certain forms and the disappearance of others. In this way also will be gained a conception of the true meaning and place of classification as an indispensable instrument for accurate determination and record, and not as an end in itself. To one that has once gained a true insight into the pleasure and worth of such studies, collections made for the sake of mere possession or lists of species discovered in a locality will not suffice. Many questions will arise which will prove a constant source of new interest. From such studies a deep and growing love for botany has in not a few cases arisen.

The British flora has interested me for upwards of forty years, and has occupied much of my attention during that time—not only as desirous to aid by my own efforts to extend our knowledge of it, but also, as a teacher, seeking to assist my students to become able to do their parts also, and making use of the materials within reach to enable me to help them. Thus our present knowledge of the plants of our own country has become known to me, and the difficulties of acquiring that knowledge have also become known through both my own experience and those of my students. The nature of the hindrances and difficulties that at present bar the way has also become familiar, as well as the steps to be taken to clear some of them away and to make the path less difficult to those who come after us; and I have also gained a fairly good acquaintance with the means at the command of students of the floras of other countries, so as to have a standard for comparison in the estimate to be formed of the condition of matters in our own country.

In how far is the present provision for the study of the flora of the British Islands sufficient and satisfactory?

I venture to hope that the subject will be regarded as among those for the consideration of which the British Association was formed, and that a favourable view will be taken of the conclusions which I take this opportunity to lay before you. What, then, is the present provision for the study of our plants? Since the days of Morrison and Ray there have been many workers, especially during the past century; and an extensive literature has grown up, in the form both of books and of papers, the latter more or less comprehensive, in the scientific journals and in the transactions of societies. These papers contain much that is of great value, but, owing to the absence of any classified index, most of the information in it is beyond the reach of anyone, except at the expenditure of much time and labour. The constantly increasing accumulation of new publications makes the

need for a classified index always more urgent ; for the mass of literature is at present one of the greatest obstacles to the undertaking of new investigations because of the uncertainty whether they may not have been already undertaken and overlooked through want of time or opportunity to search the mass exhaustively.

While the early writers of descriptive floras sought to include every species of plant known to occur in Britain, this has not been attempted during the past seventy or eighty years, and instead of one great work we now have monographs of the greater groups, such as Babington's *Manual* and Hooker's *Student's Flora* of the vascular plants, Braithwaite's *Moss-flora*, &c. Local floras still, in a good many cases, aim at including all plants known to grow apparently wild in the districts to which they refer ; but they are often little more than lists of species and varieties and of localities in which these have been found. In some, however, there are descriptions of new forms and notes of general value, which are apt to be overlooked because of the place in which they appear.

The early works were necessarily not critical in their treatment of closely allied species and varieties, but they are valuable as giving evidence of what plants were supposed to be native in England when they were published. Even the works that were issued after Linnæus had established the binominal nomenclature for a time related almost wholly to England. Sibbald in *Scotia Illustrata* (1684) enumerated the plants believed by him to be native in Scotland, and of those then cultivated. Between his book and Lightfoot's *Flora Scotia*, published in 1777, very little relating to the flora of Scotland appeared. Irish plants were still later in being carefully studied.

The floras of Hudson, Withering, Lightfoot, and Smith, all of which include all species of known British plants, follow the Linnean classification and nomenclature in so far as the authors were able to identify the Linnean species in the British flora. *English Botany*, begun in 1795, with plates by Sowerby and text by Smith, was a work of the first rank in its aim of figuring all British plants and in the excellence of the plates ; but it shared the defect of certain other great floras in the plates being prepared and issued as the plants could be procured, and thus being without order. Its cost also necessarily put it beyond the reach of most botanists, except those that had the advantage of access to it in some large library. A second edition, issued at a lower price, and with the plants arranged on the Linnean system, was inferior to the first, in the plates being only partially coloured and in having the text much curtailed. The so-called third edition of the *English Botany*, issued 1868–86, is a new work as far as the text is concerned, that being the work of Dr. Boswell Syme, who made it worthily representative of its subject ; but the plates, with few exceptions, are reissues of those of the first edition, less perfect as impressions and far less carefully coloured ; and this applies with still greater force to a reissue of the third edition a few years ago. This edition, moreover, included only the vascular plants and *Characeæ*. As this is the only large and fully illustrated British

flora that has been attempted, it is almost needless to add that in this respect provision for the study of the flora of our islands is far behind that of certain other countries, and very notably behind that made in the *Flora Danica*.

Turning next to the provision of less costly aids to the study of British plants, we have manuals of most of the larger groups. The vascular plants are treated of in numerous works, including a considerable number of illustrated books in recent years, inexpensive but insufficient for any but the most elementary students. Fitch's outline illustrations to Bentham's *Handbook to the British Flora*, supplemented by W. G. Smith, were issued in a separate volume in 1887, which is still the best for use in the inexpensive works of this kind. Babington's *Manual*, on its first appearance in 1843, was gladly welcomed as embodying the result of careful and continued researches by its author into the relations of British plants to their nearest relatives on the Continent of Europe; and each successive issue up to the eighth in 1881 received the careful revision of the author, and contained additions and modifications. In 1904 a ninth edition was edited, after the author's death, by H. and J. Groves, but, though the editors included notes left by Professor Babington prepared for a new edition, they were "unable to make alterations in the treatment of some of the critical genera which might perhaps have been desirable." The *Student's Flora of the British Islands*, by Sir J. D. Hooker, issued in 1870, took the place of the well-known *British Flora* (1830, and in subsequent editions until the eighth in 1860, the last three being issued in collaboration by Sir W. J. Hooker and Professor Walker Arnott). The third edition of the *Student's Flora* appeared in 1884, and there has been none since. Mr. F. N. Williams's *Prodromus Floræ Britannicæ*, begun in 1901, of which less than one-half has yet appeared, though a work of much value and authority, is scarcely calculated for the assistance of the ordinary student; and Mr. Druce's new edition of Hayward's *Botanist's Pocket Book* "is intended merely to enable the botanist in the field to name his specimens approximately, and to refresh the memory of the more advanced worker." In all the books that are intended for the use of British botanists, apart from one or two recently issued local floras, the classification is still that in use in the middle of last century, even to the extent in the most of them of retaining *Coniferæ* as a division of Dicotyledones. Apart from this, the critical study of British plants has led to the detection of numerous previously unobserved and unnamed forms, which find no place in the *Student's Flora*, and are only in part noticed in the recent edition of the *Manual*.

The *Lists* of vascular plants of the British flora that have recently been issued by Messrs. Rendle and Britten, by Mr. Druce, and as the tenth edition of the *London Catalogue of British Plants*, are all important documents for the study of the British flora, but they illustrate very forcibly certain of the difficulties that beset the path of the student eager to gain a knowledge of the plants of his native land. In these lists he finds it scarcely possible to gain

a clear idea of how far the species and varieties of the one correspond with those of the other, owing to the diversities of the names employed. It would be a great boon to others as well as to students were a full synonymic list prepared to show clearly the equivalence of the names where those for the same species or variety differ in the different lists and manuals. Probably in time an agreement will be generally arrived at regarding the names to be accepted, but that desirable consummation seems hardly yet in sight. Meantime, the most useful step seems to be to show in how far there is agreement in fact under the different names.

Among the Cryptogams certain groups have fared better than the higher plants as regards both their later treatment and their more adequate illustration by modern methods and standards. Several works of great value have dealt with the Mosses, the latest being Braithwaite's *British Moss-Flora*, completed in 1899. The Sphagna were also treated by Braithwaite in 1880, and are to be the subject of a monograph in the Ray Society's series. The Liverworts have been the subject also of several monographs, of which Pearson's is the fullest.

Among the Thallophyta certain groups have been more satisfactorily treated than others—*e. g.* the Discomycetes, the *Uredineæ* and *Ustilagineæ*, the Myxomycetes, and certain others among the Fungi, and the *Desmidiaceæ* among the Algæ; but the Thallophyta as a whole are much in need of thorough revision to place them on a footing either satisfactory or comparable to their treatment in other countries.

Of the Thallophyta, many more of the smaller species will probably be discovered within our islands when close search is made, if we may judge by the much more numerous forms already recorded in several groups abroad, and which almost certainly exist here also; but among the higher plants it is not likely that many additional species will be discovered as native, yet even among these some will probably be found. It is, however, rather in the direction of fuller investigation of the distribution and tendencies to variation within our islands that results of interest are likely to be obtained.

The labours of H. C. Watson gave a very great stimulus to the study of the distribution of the flora in England and Scotland, and the work he set on foot has been taken up and much extended by numerous botanists in all parts of the British Islands. It is largely owing to such work and to the critical study of the flora necessary for its prosecution that so many additions have been made to the forms previously known as British. Many local works have been issued in recent years, often on a very high standard of excellence. Besides these larger works scientific periodicals and transactions of field clubs and other societies teem with records, some of them very brief, while others are of such size and compass that they might have been issued as separate books. A few of both the books and papers are little more than mere lists of names of species and varieties observed in a locality during a brief visit, but usually there is an attempt at

least to distinguish the native or well-established aliens from the mere casuals, if these are mentioned at all. In respect of aliens or plants that owe their presence in a district to man's aid, intentional or involuntary, their treatment is on no settled basis. Every flora admits without question species that are certainly of alien origin, even such weeds of cultivated ground as disappear when cultivation is given up, as may be verified in too many localities in some parts of our country. Yet other species are not admitted, though they may be met with here and there well established, and at least as likely to perpetuate their species in the new home as are some native species.

Comparatively few writers seek to analyse the floras of the districts treated of with a view to determine whence each species came and how, its relation to man, whether assisted by him in its arrival directly or indirectly, whether favoured or harmfully affected by him, its relations to its environment—especially to other species of plants and to animals—and other questions that suggest themselves when such inquiries are entered on. It is very desirable that a careful and exhaustive revision of the British flora should be made on these and similar lines. In such a revision it is not less desirable that each species should be represented by a good series of specimens, and that these should be compared with similar series from other localities within our islands, and from those countries from which it is believed that the species originally was sprung. Such careful comparison would probably supply important evidence of forms being evolved in the new environments, differing to a recognizable degree from the ancestral types, and tending to become more marked in the more distant and longer isolated localities. An excellent example of this is afforded by the productive results of the very careful investigation of the Shetland flora by the late Mr. W. H. Beeby.

Within recent years excellent work has been done in the study of plant associations, but the reports on these studies are dispersed in various journals (often not botanical), and are apt to be overlooked by, or to remain unknown to, many to whom they would be helpful. The same is true in large measure of the very valuable reports of work done on plant-remains from peat-mosses, from lake deposits, and from other recent geological formations, researches that have cast such light on the past history of many species as British plants, and have proved their long abode in this country. Mr. Clement Reid's *Origin of the British Flora*, though published in 1899, has already (by the work of himself and others) been largely added to, and the rate of progress is likely to become still more rapid. Among the fruits and seeds recorded from interglacial and even from preglacial deposits are some whose presence could scarcely have been anticipated, e. g. *Hypecoum procumbens*, in Suffolk. Some of the colonists, or aliens now almost confined to ground under cultivation, have been recorded from deposits that suggest an early immigration into the British Islands. While much remains to be discovered, it is desirable that what is already established should find a place in the manuals of British botany.

Apart from the descriptive and topographical works and papers on our flora, there is a serious lack of information gained from the study of our British plants. Although a few types have received fuller study, we have little to compare with the work done in other countries on the structure and histology of our plants, on the effects of environment, on their relations to other species and to animals, and on other aspects of the science to which attention should be directed. On these matters, as on a good many others, we gain most of what information can be had not from British sources, but from the literature of other countries, though it is not wise to assume that what is true elsewhere is equally true here. It is as well, perhaps, that for the present such subjects should find scanty reference in the manuals in ordinary use; but, when trustworthy information has been gained within the British Islands, under the conditions prevailing here, these topics should certainly not be passed over in silence. Students of the British flora have as yet no such works of reference as Raunkiær's book on the Monocotyledons of Denmark, or the admirable *Lebensgeschichte der Blütenpflanzen Mitteleuropas*, at present being issued by Drs. Kirchner, Loew, and Schröter.

In a complete survey of the British botany there must be included the successive floras of the earlier geological formations, though they cannot as yet be brought into correlation with the recent or existing floras. In the brilliant progress made recently in this field of study our country and the British Association are worthily represented.

The present provision for the study of the British flora and the means that should be made use of for its extension appear to be these:—

Much excellent work has already been accomplished and put on record towards the investigation of the flora, but much of that store of information is in danger of being overlooked and forgotten or lost, owing to the absence of means to direct attention to where it may be found. A careful revision of what has been done and a systematic subject-index to its stores are urgently required.

The systematic works treating of the flora are in great part not fully representative of the knowledge already possessed, and require to be brought up to date or to be replaced by others.

Great difficulty is caused by the absence of an authoritative synonymic list that would show as far as possible the equivalence of the names employed in the various manuals and lists. There is much reason to wish that uniformity in the use of names of species and varieties should be arrived at, and a representative committee might assist to that end; but, in the meantime, a good synonymic list would be a most helpful step towards relieving a very pressing obstacle to progress.

There is need for a careful analysis of the flora with a view to determining those species that owe their presence here to man's aid, intentional or unconscious; and the inquiry should be directed to ascertain the periods and methods of introduction, any ten-

dencies to become modified in their new homes, their subsequent relations with man, and their influence on the native flora, whether direct or by modifying habitats, as shown by *Lupinus nootkatensis* in the valleys of rivers in Scotland.

Those species that there is reason to regard as not having been introduced by man should be investigated as regards their probable origins and the periods and methods of immigration, evidence from fossil deposits of the period during which they have existed in this country, their constancy or liability to show change during this period, their resemblance to or differences from the types in the countries from which they are believed to have been derived, or the likelihood of their having originated by mutation or by slow change within the British Islands, and their relation to man's influence on them (usually harmful, but occasionally helpful) as affecting their distribution and permanence.

The topographical distribution, though so much has been done in this field during the past sixty or seventy years, still requires careful investigation, to determine not merely that species have been observed in certain districts, but their relative frequency, their relations to man (natives of one part of our country are often aliens in other parts), whether increasing or diminishing, altitudes, habitats, &c. From such a careful topographical survey much should be learned of the conditions that favour or hinder the success of species, of the evolution of new forms and their relation to parent types in distribution, especially in the more isolated districts and islands, and of other biological problems of great interest. A most useful aid towards the preparation of topographical records would be afforded by the issue at a small price of outline maps so as to allow of a separate map being employed for recording the distribution of each form.

A careful study of the flora is also required from the standpoint of structure and development, with comparison of the results obtained here with those of workers in other countries where the same or closely allied species and varieties occur. It is also needed in respect of the relations between the plants and animals of our islands, both as observed here and in comparison with the already extensive records of a similar kind in other countries. On such topics as pollination, distribution of seeds, and injuries inflicted by animals, and galls produced by animals or plants, we have still to make use very largely of the information gained abroad; and the same holds good with regard to the diseases of plants.

While *English Botany* in its first edition was deservedly regarded as a work of the first rank among floras, it has long been defective as representing our present knowledge of British plants, and it has not been succeeded by any work of nearly equal rank, while other countries now have their great floras of a type in advance of it. There is need for a great work worthy of our country, amply illustrated so as to show not only the habit of the species and varieties, but also the distinctive characters and the more important biological features of each. Such a flora would

probably require to be in the form of monographs by specialists, issued as each could be prepared, but as part of a well-planned whole. It should give for each plant far more than is contained in even the best of our existing British floras. Means of identification must be provided in the description, with emphasized diagnostic characters; but there should also be the necessary synonymy, a summary of topographical distribution, notes on man's influence upon distribution, abundance, &c., on any biological or other point of interest in structure or relations to habitat, environment, associated animals or plants, diseases, &c. Local names, uses, and folklore should also be included; and for this the need is all the greater, because much of such old lore is rapidly being forgotten and tends to be lost. In a national flora there should be included an account of the successive floras of former periods, and, as far as possible, the changes that can be traced in the existing flora from its earliest records to the time of issue should be recorded.

A flora of this kind would not only afford the fullest possible information with regard to the plant world of the British Islands at the date of issue, but would form a standard with which it could be compared at later periods, so as to permit of changes in it being recognized and measured. In the meanwhile, the production of such a flora can be regarded only as an aim towards which to press on, but which cannot be attained until much has been done. But while the fulfilment must be left to others, we can do something to help it on by trying to remove difficulties from the way, and to bring together materials that may be used in its construction.

I have sought to call attention to the difficulties that I have experienced, and to directions in which progress could be made at once, and to provision which should be made for the advancement of the study of the British flora with as little delay as possible. There is, I feel assured, the means of making far more rapid and satisfactory progress towards the goal than has yet been accomplished. Many persons are interested in the subject, and would gladly give their aid if they knew in what way to employ it to the best purpose. As a nation we are apt to trust to individual rather than to combined efforts, and to waste much time and labour in consequence, with discouragement of many who would gladly share the labour in a scheme in which definite parts of the work could be undertaken by them.

I believe that a well-organized botanical survey of the British Islands would give results of great scientific value, and that there is need for it. I believe, also, that means exist to permit of its being carried through. There is no ground to expect that it will be undertaken on the same terms as the Geological Survey. A biological survey must be accomplished by voluntary effort, with possibly some help towards meeting necessary expenses of equipment from funds which are available for assistance in scientific research. Is such a survey not an object fully in accord with the objects for which the British Association exists? In the belief

that it is so, I ask you to consider whether such a survey should not be undertaken; and, if you approve the proposal, I further ask that a committee be appointed to report on what steps should be taken towards organizing such a survey, and preparing materials for a national flora of the British Islands.

ALABASTRA DIVERSA.—Part XIX.

By Spencer le M. Moore, B.Sc., F.L.S.

(Concluded from p. 222.)

2. Acanthaceæ Novæ.

Thunbergia (§ Thunbergiopsis) **alba,** sp. nov. Caule ascendente ramoso distanter folioso glabro, foliis longipetiolatis ovatis vel ovato-oblongis acutis basi truncato-rotundatis interdum levissime cordatis integris vel basin versus dentatis 5-nervibus membranaceis fere omnino glabris, floribus axillaribus longipedunculatis, bracteolis pro rata parvis ovato-oblongis obtusis glanduloso-pilosis, calycis paucilobati lobis deltoideis obtusis, corollæ tubo bracteolas duplo excedente superne gradatim ampliato lobis tubo multo brevioribus inter se subæqualibus obovato-oblongis obtusissimis margine crispis, antheris ovatis apice productis loculis basi barbellatis margine ciliatis staminum duorum basi muticis duorum altero mutico altero incurvo-calcarato, capsula bracteas bene excedente subtilissime sericea.

Hab. Toro, forest near Fort Portal, 4500 ft.; *Bagshawe*, 1267.

Foliorum limbus summum 9·5 × 5 cm., modicus 5–7 × 2·5–3 cm., pag. inf. pallidus; petioli 2–3·5 cm. long., foliorum summorum maxime abbreviati vel etiam subnulli. Pedunculi 2–4 cm. long., graciles. Bracteolæ 13 × 6 mm., virides, reticulato-nervosæ. Flores albi. Calyx 1·25 mm. alt., hujus lobi circa ·5 mm. Corollæ tubus 2·5 cm. long., deorsum 3–4 mm., sursum 7–8 mm. lat., extus parissime pilosus; lobi circa 6 × 5 mm. Antherarum loculi inter se vix æquilongi, 2–2·5 mm. long., loc. calcaratus 3 mm. Discus in toto 1·25 mm. alt.; hujus lobi ·25–·5 mm. Ovarium 2 mm. long.; stylus 14 mm. long., stigmatis os fere 5 mm. diam. Capsula 23 mm. long. (rostrum 15 mm.). Semina ambitu suborbicularia, plano-convexa, margine tuberculata alibi foveolata, saturate brunnea, 4 mm. diam.

Apparently nearest *T. mollis* Lindau, but different from it in shape of leaf, small bracteoles, corolla, &c.

Dyschoriste Monroi, sp. nov. Ramis sat validis quadrangularibus frequenter ramulosis ut ramuli subtiliter pubescentibus cito puberulis, foliis parvis petiolatis oblongo-obovatis obtusis vel obtusissimis basi obtusis firme membranaceis utrinque microscopice puberulis, cymis paucifloris pseudo-axillaribus sc. ramulis perbrevibus suffultis, bracteolis parvis oblongis acutis puberulis, calycis puberuli tubo superne leviter amplificato lobis triangulari-

subulatis acuminatis rigidis nequaquam setaceis tubo plano brevioribus, corollæ puberulæ tubo calycem duplo excedente faucibus amplificato lobis obovato-oblongis obtusissimis inter se subæqualibus quam tubus multo brevioribus, antherarum loculis basi mucronatis, capsula calycem paullo excedente.

Hab. Rhodesia, Victoria; *C. F. N. Monro*, 950. [Also in Kew Herb., Bulawayo; *Gardner*, 98.]

Folia pleraque 10–20 mm. long., 7–10 mm. lat., cystolithis parvulis parum aspectabilibus prædita; petioli 2·5–5 mm. long. Bracteolæ 3–4 mm. long. Calycis tubus 10 mm. long., paullo supra basin 2 mm., superne 3 mm. lat.; lobi 4–4·5 mm. long. Corollæ tubus 22 mm. long., ima basi 1·5 mm., medium tenus 2 mm., ore 4 mm. lat.; lobi 8 mm. long. Antheræ oblongæ, 1·75 mm. long. Ovarium apice (ut styli basis) pilis glandulosis brevissimis onustum ceteroquin glabrum, 2·5 mm. long.; stylus piloso-puberulus, 18 mm. long. Capsula lineari-clavata, acuta, 15 mm. long., inferne 1 mm. superne 2·5 mm. lat.

Looks very like *D. Fischeri* Lindau, but easily distinguished from that by the calyx.

Barleria (§ Eu-Barleria) **paludosa**, sp. nov. Verisimiliter satis elata caule erecto sursum ramoso ut folia et spicæ et calyces pilis stellatis simplicibus intermixtis dilute fulvis appresse hispidulo-tomentoso mox pubescente, foliis ovatis vel ovato-oblongis obtusis basi in petiolum brevem angustatis firme membranaceis pag. sup. tandem sparsim strigoso-puberulis, floribus in spicis brevibus paucifloris sat longe pedunculatis foliis floralibus ceteris similibus nisi minoribus præditis hispidulo-tomentosis dispositis, bracteolis lineari-oblongis obtusis facie concavis quam folia floralia paullo brevioribus, calycis bracteolas plane excedentis segmentis anticis alte connatis ambitu anguste ovato-oblongis ut posticum æquilongum paullo angustius obtusissimis segmentis lateralibus quam reliqua brevioribus lanceolatis acuminatis, corollæ tubo superne curvato necnon paullulum coarctato lobis inter se subæqualibus, staminibus 2 exsertis staminodiis 3 floris unici solum visi omnino antheriferis, ovulis quoque in loculo 2.

Hab. Congo Free State, in swamps at Kundelunga; *Kässner*, 2619.

Folia summum 9 × 5 cm., modica 6–7 × 2·5–3 cm., in sicco griseo- vel subfulvo-viridia, subtus pallidiora; ord. sec. costæ utrinque 4–6, pag. inf. eminentes; reticulum laxum, utrobique prominens; petioli ± 4 mm. long. Pedunculi solemniter 2–6 cm. long. Flores verisimiliter flavi. Folia floralia pleraque 1·5–3 × 1–1·5 cm. Bracteolæ ± 1 cm. long. Calycis segmenta coriacea, exteriora 20 mm. long., 7·5–8 mm. lat., interiora 15 mm. long. Corollæ tubus 13 mm. long., inferne 4·5 mm., ore 4 mm. lat.; lobi oblongo-obovati, retusi, 22–23 mm. long. Filamenta 20 mm. long.; antheræ late oblongæ, utrinque obtusissimæ, 6·5 mm. long. Staminodia late deltoidea, acuminata, 2–2·5 mm. long. Ovarium ovoideum, subtiliter pubescens, 5 mm. long.; stylus 25 mm. long. Capsula oblongo-ovoidea, apice breviter rostrata, 9 mm. long.

Differs from *B. salicifolia* S. Moore in the hispidulous indu-

mentum, the broader leaves, smaller bracteoles, differently shaped calyx-segments, &c.

Barleria (§ Eu-Barleria) **Bagshawei,** sp. nov. Fruticulus caule a basi repente ad nodos radicante ascendente mox præter nodos barbatos lineasque duas puberulas fere glabro novellis strigoso-pubescentibus, foliis ovatis acutis vel acuminatis basi in petiolum manifestum subito angustatis membranaceis utrinque sparsim appresse strigoso-pilosis, floribus 1–2 quovis in axillis foliorum floralium quam cetera multo breviorum spicam elongatam interruptam formantibus, bracteolis anguste lineari-oblanceolatis acutis quam folia floralia plane minoribus, calycis appresse sparsim strigoso-pubescentis segmento postico rhombeo-ovato obtuso quam segmenta antica apice biloba paullo majore segmentis exterioribus margine denticulatis vel subintegris segmentis lateralibus anguste lineari-lanceolatis longe acuminatis, corollæ tubo superne amplificato limbo tubo breviore subbilabiato lobis 3 anticis altius connatis, staminodiis 3 uno ananthero quam reliqua antherifera longiore, ovulo quove in loculo solitario secundi rudimento minutissimo.

Hab. Shore of Lake Albert Edward, east side, and Unyoro, bank of Nile at Foweira; *Bagshawe*, 1412, 1577.

Folia pleraque 5–7 × 2·5–3·5 cm. (raro usque ad 12 × 7 cm.) pauca juniora in folia floralia transeuntia, in sicco viridia; petioli sæpius 3–10 mm. long. Folia floralia inferiora 2–3 cm. superiora 1–2 cm. long., 7–10 mm. lat. Bracteolæ 6–10 mm. long., ut folia floralia pubescentes. Flores cyanei. Calycis segmentum posticum 13–17 × 7–11 mm., anticum 11–13 × 6·5–9 mm., hujus lobi triangulares, acuti, 2·5 mm. long. Corolla 35 mm. long.; tubus 17 mm. long., inferne 4 mm. superne 12 mm. diam.; lobi obovati, obtusissimi, antici 9 × 6 mm. postici 12 × 9 mm. Filamenta 18 mm. long., antheræ 3·5 mm.; staminodia breviora 2 mm. long., stam. anantherum longe setiferum, 3·5 mm. long. Discus undulatus, 1·25 mm. alt. Ovarium 3 mm. long., stylus 23 mm. Capsula 2-sperma, ovoidea, acuta, 12 mm. long.; semina 5 mm. lat.

Belongs to the group of closely related species clustering round *B. Volkensii* Lindau. From this it differs chiefly in the smaller, at most denticulate outer segments of the calyx, and the much shorter corollas with smaller limb.

Crabbea Kaessneri, sp. nov. Subacaulescens foliis sessilibus amplis ovatis vel ovato-suborbicularibus obtusissimis margine repandis subintegrisve firme membranaceis supra glabris subtus in costis sparsim piloso-hispidulis, cymis sessilibus plurifloris, bracteis inermibus ovatis obtusis (intimis oblongo-lanceolatis) margine denticulato-ciliolatis, calycis segmentis lanceolatis acuminatis segmento postico quam antica longiore, corollæ tubo calycem longe excedente dimidio superiore ampliato lobis inter se subæqualibus suborbicularibus, staminibus paullulum infra medium tubum insertis, stylo ima basi pubescente, stigmatis lamello suborbiculari, ovulis quoque in loculo 2.

Hab. Congo Free State, in vlei at Tonkoosji; *Kässner*, 2337.

Folia summum 10 × 8 cm., minora 6 × 4 cm., in sicco brun-

nescentia, pag. sup. subnitida; costæ costulæque subtus maxime perspicuæ. Bracteæ exteriores adusque 3 × 2·5 mm.; interiores ± 13 mm. long., 2–4 mm. lat. Calycis segmenta 4·5 mm. long., seg. posticum 7·5 mm. Corollæ tubus fere 20 mm. long., inferne 2 mm. superne 6 mm. lat.; lobi circa 6 × 7 mm. Antherarum loculi 2 mm. long. Discus lobatus, 1 mm. alt. Ovarium glabrum, 2·25 mm. adæquans. Florum nondum pansorum stylus 7 mm. long. eorundem stigmatis lamella ·75 × 1 mm.

The position of this is next *C. pedunculata* N. E. Br., which has differently shaped leaves, peduncled cymes, &c.

Lepidagathis (§ NEURACANTHOPSIS) **nemorosa**, sp. nov. Planta circa bispithamea caule ascendente simplici attenuato aliquantulum anfractuoso subdistanter folioso glabro, foliis petiolatis oblongo-lanceolatis obtusis basin versus in petiolum gradatim extenuatis firme membranaceis nitidulis glabris, spicis subcylindricis in axillis congestis, foliis floralibus pauciserialibus imbricatis cymbiformibus ovatis mucronatis breviterve acuminatis ut calycis segmenta scariosis margine ciliolatis glabrisve longitrorsum eminenter nervosis, calycis segmentis folia floralia excedentibus ovato-lanceolatis (lateralibus lineari-lanceolatis) acuminatis microscopice puberulis segmento postico quam antica paullo longiore, corollæ tubo calyci æquilongo superne leviter constricto ore subito dilatato intus juxta medium piloso-pubescente labii antici lobo intermedio quam laterales multo latiore, antheris posticis 1-locularibus, stylo exserto, ovulis in loculo binis.

Hab. Congo Free State, Lofoi River, under trees; *Kässner*, 2655.

Folia 5–8 cm. long., 12–22 mm. lat., pag. inf. pallidiora, costæ reticulumque præsertim pag. sup. bene aspectabiles; petioli 5–15 mm. long. Spicarum glomerulus circa 12 mm. diam., breviter pedunculatus. Spicæ circa 3 mm. lat. Folia floralia infima circa 6 mm. long., superiora 8–9 mm., omnia ut calycis segmenta badia. Calycis segmentum posticum (ut lateralia) 13 mm. long., seg. anticum 12 mm. Corollæ tubus 13 mm. long., deorsum 3 mm., sursum 2 mm. lat., ore 5 mm.; labii antici lobi laterales oblongi, obtusi, 10 × 4 mm.; lobus intermedius 8 × 6 mm.; labium posticum oblongo-ovatum, 15 mm. long. Staminum ant. filamenta 8 mm. long., post. 5 mm.; antherarum loculæ oblongæ, basi mucronulatæ, 2·5 mm. long. Discus 1 mm. alt. Ovarium oblongo-ovoideum, apice ipso pilis brevibus onustum, 3·5 mm. long. Stylus glaber, 18 mm. long.

To be inserted in the genus next *L. pallescens* S. Moore, which, *inter alia*, has different floral leaves.

A plant in the Kew Herbarium, collected at Broken Hill by Allen (No. 489), is most probably to be referred here, but the flowers are too young to warrant certainty.

Adhatoda Eylesii, sp. nov. Caule erecto valido cito bifariatim puberulo deinde glabro, foliis petiolatis ovatis acuminatis basi rotundatis ipsa sæpe obtusis margine ciliolatis ceterum fere omnino glabris membranaceis, spicis elongatis basi ramosis omnimodo (sc. bracteis et bracteolis et calycis segmentis haud exemptis) pilis

longis strigillosis glandulosis copiose onustis, bracteis ovatis acuminatis quam bracteolæ lanceolatæ obtusiusculæ longioribus, calycis segmentis inter se subæqualibus lanceolato-oblongis obtusis apice induratis bracteolis æquilongis, corollæ tubo superne parum inflato labio antico ovato tridentato quam labium posticum erectum galeatum tubum subæquantem extus pubescentem multo breviore, staminibus sub galea absconditis antherarum loculis basi obscure mucronulatis.

Hab. Rhodesia; Mazoe, on west side of Iron Mask Hill, 4500 ft.; *F. Eyles*, 560.

Planta ± metralis (sec. cl. detectorem 3–4 ped. alt.). Folia pleraque circiter 10 × 5 cm., pauca juniora gradatim imminuta in bracteas transeuntia, in sicco olivacea, copiose cystolithigera; ord. sec. costæ utrinque 7–8, inferiores magis approximatæ, ut reticulum laxum utrinsecus sat eminentes; petioli summum 15 mm. long., foliorum summorum multo breviores. Spica fere 25 cm. long.; hujus fasciculi inferiores inter se distant 2·5–4 cm. Bracteæ circa 20 mm., bracteolæ ut calycis segmenta 14 mm. long. Corollæ tubus 14 mm. long., ima basi 3·5 mm., medium tenus 8 mm., ore 9 mm. diam.; labii antici 10 mm. long. et 7 mm. lat. palatus valde intruens; labium posticum 15 mm. long. Antheræ latæ oblongæ, ægre 5 mm. long. Discus lobulatus, 1 mm. alt. ovarium 2 mm. long. Stylus glaber, circa 18 mm. long.

Easily recognized by the long densely glandular-hairy spikes.

Referable to this is a Congo plant (Kitimbo; *Kässner*, 2334) with somewhat smaller leaves and shorter simple spikes not exceeding 10 cm. in length.

Justicia (§ Rostellularia) **Bagshawei,** sp. nov. Caule bispithameo erecto gracili rariramoso appresse piloso-pubescente deinde puberulo novellis dense strigoso-pubescentibus, foliis amplis longipetiolatis ellipticis sæpe caudato-acuminatis apice ipso obtusis basi in petiolum extenuatis tenuiter membranaceis sparsim appresse strigoso-puberulis, spicis terminalibus breviter pedunculatis brevibus ovoideis vel subglobosis dense plurifloris, bracteis anguste lineari-lanceolatis acutis ut bracteolæ pilis longis hispidis patentibus brevioribus glandulosis intermixtis copiose ciliatis, bracteolis linearibus bracteas subæquantibus, calycis segmentis 5 inter se subæqualibus quam bracteolæ multo brevioribus anguste lineari-lanceolatis longe acuminatis glanduloso-ciliatis, corollæ tubo sursum leviter ampliato calycem fere duplo excedente limbi tubo plane brevioris labio postico abbreviato brevissime bidentato anteriore amplo breviter trilobo palato maxime intruso, antherarum loculo inf. sat longe calcarato.

Hab. Uganda, Ngusi River, east of Lake Albert; *Bagshawe*, 1362.

Foliorum limbus solemniter 7–10 cm. long., 2·5–4·5 cm. lat., foliorum summorum ad 3 × 1 cm. reductus, in sicco viridis, subtus griseolus; petiolus 1–2 cm. long., foliorum summorum 5 mm. Spicæ 12–18 mm. long. Bracteæ 7 × ·75 mm., bracteolæ 6·5 × 2·5 mm. long. **Flores punicei.** Calycis segmenta ægre 3 mm. long. Corollæ tubus 5 mm. long., inferne 2 mm. superne 2·5 mm.

lat.; labium anticum 3·5 × 4 mm., hujus lobus intermedius 1 × 1·5 mm., laterales paullo minores, lobi omnes obtusissimi; labium posticum 3 mm. long. Antherarum loculus sup. ·75 mm. long., inf. paullulum longior calcare parum curvato ·4 mm. long. exempto. Ovarium 1·5 mm. long., puberulum; stylus 5 mm. long. Capsula 5·5 mm. long., 4-sperma, puberula. Semina 1·5 mm. diam., arcte tuberculata.

Differs from *J. Kirkiana* T. And. chiefly in the leaves, the short dense spikes, and narrow bracts and bracteoles.

Justicia (§ CALOPHANOIDES) **toroensis,** sp. nov. Ramis e caule tenero repente ad nodos radicante ascendentibus gracilibus sparsim ramulosis minute puberulis vel fere glabris, foliis petiolatis ovatis acutis basi rotundatis ipsa cuneatis tenuiter membranaceis supra pilis perpaucis appressis præditis subtus glabris necnon pallidioribus, floribus in axillis solitariis subsessilibus, bracteolis subobsoletis, calycis segmentis lineari-lanceolatis longe acuminatis glabris vel sparsissime piloso-ciliatis, corollæ extus puberulæ tubo calycem plane excedente subcylindrico labio antico late obovato quam tubus breviore, antherarum loculo inferiore brevissime calcarato. Ovulis quoque in loculo 2.

Hab. Toro, forest near Fort Portal; *Bagshawe*, 1268.

Planta 1–2-spithamea. Folia solemniter 2·5–4·5 cm. long., 1–2 cm. lat., in sicco læte viridia; petioli ± 5 mm. long. Pedunculi ·75 mm. long.; bracteolæ triangulares, pedunculis æquilongæ. Flores dilute punicei. Calyx 6·5 mm. long. Corollæ tubus 10 mm. long., basi 1·75 mm., medio 1·5 mm., ore ægre 3 mm. diam.; labium anticum 7 × 5 mm. hujus lobus intermedius 3·5 × 3 mm.; lobi laterales 3 × 2 mm.; labium posticum late oblongum, emarginatum, 5 mm. long. Stamina exserta; antherarum loculus superior 1 mm. long., inferior 1·25 mm. Ovarium 3·5 mm. long. apice barbatum; stylus 13·5 mm. long. Capsula obtusa glabra. 9 mm. long., verisimiliter 2-sperma.

Allied to *J. Galeopsis* T. And., but with several differences in the leaves and flowers.

Dicliptera microchlamys, sp. nov. Caule gracili repente ad nodos radicante ramos ascendentes ramulosos spithameos vel fere bispithameos glabros ex nodis gignente, foliis ellipticis utrinque angustatis apice sæpe breviter caudato-acuminatis ipso obtusis basi acuminatis glabris petiolis puberulis quam limbus brevioribus suffultis, spiculis 2-floris in axillis superioribus sublaxe fasciculatis, bracteis inter se inæqualibus parvulis rhombeo-rotundatis basi apiceque rotundatis apice ipso brevissime acutis margine ciliato exempto glabris in sicco læte viridibus, bracteolis anguste lineari-lanceolatis acuminatis calyce brevioribus, calycis segmentis lineari-lanceolatis acuminatis ciliatis, corollæ tubo recto cylindrico bracteas amplectantes subæquante limbi tubo brevioris labio antico late oblongo breviter 3-dentato labio postico suborbiculari integro, filamentis labiis brevioribus antherarum loculis superpositis muticis.

Hab. Ngusi River, east of Lake Albert, 3000 ft.; *Bagshawe*, 1387.

Foliorum limbus sæpius 2·5–4 cm. long., 1–2·3 cm. lat., subtus pallidior, cystolithis sub lente nullo negotio aspectabilibus crebro indutus; petioli 5–15 mm. long. Flores albi. Pedicelli solemniter 1–2 mm. long. Bracteæ 5–7 × 4·5–6 mm. Bracteolæ 1·25 mm. long., ciliatæ. Calyx ægre 3 mm. long. Corollæ superne puberulæ tubus 5 × 1 mm.; labium anticum 2·5 × 1·25 mm., posticum 2·5 × 3 mm. Filamenta 2 mm. long.; antherarum loculi ·5 mm. long. Ovarium ovoideum, 1 mm. long., stylus, 6·5 mm.

To be inserted in the genus next *D. Elliotii* C. B. Clarke, which has rather larger hairy bracts slightly cuneate at the base, shorter and acute, not acuminate, calyx-lobes, somewhat larger corollas with a curved tube and a broader 3-lobed lower lip, &c.

3. Asclepiadaceæ duæ prætervisæ.

Asclepias uvirensis, sp. nov. Caule ascendente superne folioso puberulo, foliis sessilibus elongatis linearibus obtusis margine revolutis minute scabriusculo-pubescentibus, umbellis spec. unici solummodo visi 2 corymbosis longipedunculatis 4-floris, pedunculis folia longe excedentibus compressiusculis bifariatim puberulis, pedicellis quam pedunculi 2–4-plo brevioribus sparsim puberulis, bracteis——, calycis segmentis lineari-lanceolatis acutis puberulis, corollæ alte divisæ segmentis ovato-oblongis obtusis extus puberulis, coronæ phyllis fere 2 mm. a basi columnæ stamineæ affixis eandemque bene superantibus oblongis leviter curvatis apice rostro brevi obtuso inflexo onustis marginibus inflexis superne in cornu erectum rostrum excedens productis intus papillosis edentulis, antherarum appendicibus suborbicularibus supra stigma breviter inflexis.

Hab. Uvira, shore of Lake Tanganyika, *Kässner*, 3162.

Folia circa 3 cm. long., in sicco 1·5 mm. lat., viridi-grisea. Pedunculi 8 cm. long., ascendentes. Pedicelli 2–4 cm. long. Calycis segmenta ægre 5 mm. long. Corollæ tubus 1·5 mm., segmenta 10 mm. long. Coronæ phylla 6 mm. long., rostrum 1 mm., cornua 2 mm. long. Columna staminea 5 mm. long. Antherarum alæ fere 3 mm. long. Pollinia oblongo-pyriformia, 1 mm. long.; caudicula inferne filiformi, superne lata alata, 2 mm. long.; glandula ·4 mm. long. Folliculus ignotus.

Differs from *A. macrantha* Hochst. chiefly in the leaves, the narrow sepals, and the more prominent horns and beaked apex of the coronal leaves.

Ceropegia Kaessneri, sp. nov. Caule volubili compressiusculo fere glabro, foliis parvulis ovatis acuminatis basi obtusis margine microscopice ciliolatis membranaceis petiolis filiformibus quam folia brevioribus insidentibus, umbellis lateralibus sat longe pedunculatis 2–4-floris glabris, bracteis minutis filiformibus, pedicellis tenuibus quam pedunculus brevioribus glabris, calycis segmentis lineari-lanceolatis acutis glabris, corollæ ad medium usque divisæ tubo dimidio inferiore inflato superne cylindrico ore brevissime subito dilatato lobis linearibus apice connatis replicatis piloso-

puberulis, coronæ phyllis exterioribus in cupulam lobatam connatis lobis deltoideis bifidis, phyllis interioribus spathulatis ex cupula longe eminentibus, antheris oblongis stylum superantibus.

Hab. Congo Free State, Kitimbo; *Kässner*, 2349.

Folia 2–2·5 cm. long., 1–1·4 cm. lat.; petioli ± 5 mm. long. Pedunculi summum 23 mm. long.; pedicelli ± 8 mm.; bractea 1 mm. Calycis segmenta 2 mm. long. Corolla 23 mm. long.; tubus 11 mm. long., inferne 3·5 mm., superne 2 mm., ore 4 mm. diam., intus glaber. Coronæ exterioris cupula vix 1 mm. long., hujus lobi ·75 mm. long.; phylla interiora cupulæ lobis affixa, 1·5 mm. long. Antheræ ·5 mm. long. Pollinia globosa, ·2 mm. diam.

Differs from *C. stenantha* N. E. Br. in the foliage, longer peduncles and pedicels, corolla-tube more inflated at base, hairy corolla-lobes, &c.

SHORT NOTES.

Sibthorp's Lincolnshire Plants.—Recently I have come across in the Library of the Botanic Gardens, Oxford, a small MS. list of plants noticed in Lincolnshire about the year 1780, by Professor Sibthorp, the author of the sumptuous *Flora Græca*. These plants are doubtless in most cases the earliest evidence of their occurrence in the county to which his family belonged. Only the definite localities are quoted.—*Ranunculus parviflorus* L., *Thlaspi arvense* L., and *Cerastium arvense* L. In arvis prope Easton.—*Althæa officinalis* L. In palustribus.—*Malva sylvestris* L.—*Rhamnus catharticus* L. In sylvis circa Easton.—*Genista tinctoria* L., and *G. anglica* L. In pascuis circa Easton.—*Lathyrus palustris* L. In pascuis humidis circa Easton.—*Geum rivale* L. In sylvis humidis circa Easton.—*Alchemilla vulgaris* L.—*Pimpinella magna* Huds. In sylvis circa Easton. *Sium latifolium* L.—*Sanicula europæa* L. In sylvis circa Easton.—*Caucalis nodosa* Scop.—*Œnanthe aquatica* Poir.—*Galium erectum* Huds. In pascuis prope Easton.—*Antennaria dioica* Gaertn. In pascuis prope Easton.—*Senecio integrifolia* Clairv. In ericeto prope Easton.—*Blackstonia perfoliata* Huds. Prope Spilsbye.—*Atropa Belladonna* L. Circa Long Sutton.—*Lysimachia vulgaris* L.—*Statice Armeria* L. and *S. Limonium*.—*Stachys germanica* L. Circa Easton prope Grantham.—*Plantago maritima* L.—*Hippophae Rhamnoides* L.—*Stratiotes Aloides* L.—*Orchis ustulata* L. *Neottia Nidus-avis*. In sylvis umbrosis circa Easton.—*Helleborine latifolia* Druce. In sylvis prope Easton. *Echinodorus ranunculoides* Engelm.—*Typha angustifolia* L.—*Triglochin maritimum* L.—*Potamogeton pusillum* L.—*P. crispus* var. *serratus*.—*P. Friesii* Rupr.—*Scirpus maritimus* L. *Ammophila arenaria* Link. — *Osmunda regalis* L.—*Chara hispida* L. Sibthorp also records *Astragalus arenarius* (which is doubtless *A. danicus* Retz.), in ericeto Lincoln, and *Chara tomentosa* L., the identity of which is doubtful.—G. Claridge Druce.

Goodyera repens in Norfolk.—On the 8th of July, 1885, Miss Southwell found one large patch of *Goodyera repens* in the Decoy Wood at Westwick, East Norfolk. A week after the wood was carefully searched, but no more could be found.* In 1890 Miss A. M. Barnard found it in abundance in the neighbourhood of Holt, East Norfolk. This locality is about twelve miles as the crow flies from Westwick, where it is now exterminated.† On the 25th of July, in this year, Mr. A. W. Nicholson, of Norwich, found at Cawston, East Norfolk, "about twenty specimens, six having flowering-stems, growing among *Erica cinerea*, and rather near to several Scotch firs at the edge of a clearing, all growing within an area of two square yards. The specimens were about seven inches high." The plant is still found near Holt, and will possibly become naturalized, but, as Mr. Geldart, of Norwich, concluded in 1890, it cannot be accepted as indigenous to Norfolk. Its nearest recorded station to Norfolk is Houghton Wood, Market Weighton, in South-east Yorkshire, whence I have specimens gathered by the late Mr. W. W. Reeves. The old reports for Herts (Webb & Coleman, Fl. Herts (1849), p. 293) and Hants (Townsend, Fl. Hants, ed. 2 (1904), p. 422) were doubtless erroneous. The species has generally been associated with woods of conifers, but Mr. Spence sent me a specimen from "hilly ground near Stromness, Orkney." Mr. Barclay found two or three plants on a moor close by the seaside, two miles west of Portsay, Banffshire; and Mr. Evans (Ann. Scot. Nat. Hist. (1909), p. 123) records a specimen from Hanay, Orkney.—Arthur Bennett.

Geranium Endressi Gay.—The above-named handsome plant is getting quite naturalized in the parish of Halford, Craven Arms, Salop, where, in company with the rector of the parish, the Rev. E. F. Gilchrist de Castro, I visited its locality in June, 1908. It was growing in some plenty by a hedgerow, situate some little distance from houses or gardens. I have also received from Miss Ida M. Roper specimens of the same Geranium, found by her growing in waste places between Clifton and Bristol. It seems very probable that the plant will find a congenial home in this country, especially, as, like its congeners *G. phæum* L. and *G. striatum* L., it seeds freely and copiously, and flowers virtually the whole summer through. A native of the Pyrenees, it was described by J. Gay (Ann. Sci. Nat. sér. 1, xxvi. (1832), p. 228), and is very conspicuous, having bright carnation flowers, sometimes almost salmon-hued, the petals being cuneate-obovate, the half-expanded buds assuming an infundibuliform appearance. The leaves are never spotted, as is the case in the allied *G. maculatum* L., with which it might easily be confounded, but here the petals are much broader in proportion, and of a paler carnation hue. This latter plant I have found abundantly in woods from Canada to Florida, it being especially common in the Chicora Woods, near Charleston, South Carolina.—J. Cosmo Melvill.

---

* Trans. Norw. and Norf. Nat. Soc. (1885), p. 255. † *l. c.* (1890), p. 329.

JUNCUS TENUIS Willd.—This plant has been found recently (July, 1910) in three places in Surrey (v.-c. 17), where Mrs. Davy has discovered it near Woking and near Pyrford, and Mr. Percy Smith has found it near Farnham Park (specimen seen). Mrs. Davy kindly took me to the Woking locality, where we saw several clumps on a moory piece of ground, unfortunately threatened by building operations. The Pyrford station is less likely, I am told, to be disturbed. *Juncus tenuis* has now been recorded from at least twenty-four British counties or vice-counties. Mr. A. Bennett's Supplement to Top. Bot. in Journ. Bot. 1905, enumerates fourteen, and the following may be added:—

11. Hants S. *J. F. Rayner*, Journ. Bot. 1910, p. 235.
14. Sussex E.! *Mrs. Davy & G. C. Druce*, l. c. 1906, p. 241.
37. Worcester. *R. F. Towndrow*, l. c. 1909, p. 386.
48. Merioneth! *D. A. Jones*, Harlech, 1898, Hb. Brit. Mus.
70. Cumberland. *E. & H. Drabble*, Journ. Bot. 1906, p. 392.
88. Perth Mid. *Robinson.* Specimen seen by Mr. A. Bennett.
90. ? Forfar. *J. W. H. Traill*, Ann. Scot. Nat. Hist. 1906, p. 201.
91. Kincardine. *J. W. H. Traill*, l. c. 1903, p. 251.
96. Easterness. *J. W. H. Traill*, l. c. 1907, p. 251.
98. Argyll! *P. Ewing*, near Lochgilphead, 1902, Hb. Brit. Mus.

—C. E. SALMON.

DURHAM PLANTS.—In Teesdale in 1909 I found the following plants (those marked * are not included for v.-c. 66 in Top. Bot.; those marked † are not native):—**Polygala oxyptera* Reichb. Near Cockland Nook.—*Geranium sylvaticum* L.* var. *parviflorum* Blytt. Teesdale, with the type.—*Alchemilla vulgaris* L.* var. *glabra* DC. Teesdale, frequent.—**Taraxacum spectabile* Dahlst. var. *maculigerum* (Dahlst.). Near Widdybank.—*Hieracium diaphanum* Fries.—*H. vulgatum* Fries.—*H. anglicum* Fries.—*H. euprepes* var. *clivicolum* F. J. H.—*H. expallidiforme* Dahlst. Kindly named by Rev. A. Ley.—†*Verbascum Blattaria* L. Middleton; the pale-flowered form.—*Melampyrum pratense* L.* var. *hians* Druce. Near Winch Bridge.—†*Mentha spicata* L. Middleton.—**Thymus glaber* Mill. Widdybank.—**T. ovatum* Mill.—**Plantago alpina* L. Widdybank; named by Mr. F. N. Williams.—*Populus nigra* L. and *P. deltoidea* Marsh. Near Middleton.—**Orchis cruenta* O. F. Muell. Near Middleton; named by Mr. Rolfe.—**O. incarnata* L. Teesdale.—*O. maculata*, L.* var. *præcox* Webster (*cricetorum* Lint.); also type.—*Festuca rubra* L.* var. *barbata* (Hackel). Winch Bridge.—*Poa subcærulea* Sm. Widdybank.—G. C. DRUCE.

MALAXIS PALUDOSA IN CORNWALL.—On p. 420 of my *Flora of Cornwall* I state of *Malaxis*:—"I have seen in the herbarium of Mr. J. F. Pickard, of Leeds, a poor specimen of this plant, which was collected by his aunt, the late Miss C. Smith, and is labelled 'Cornwall, 1848.' Although the record may be a correct one, the evidence is scarcely satisfactory for the inclusion of *Malaxis* in the Cornish Flora. Botanists should make a careful search for the plant." To my surprise and delight this will-o'-

the-wisp, which has eluded many a hard worker at the flora of the westernmost county, has now been found by two little children, Peter and Kitty Hambly, of Westcott Farm, Callington. Both children, whose ages respectively are twelve and ten, are much interested in nature study, and when plant hunting on marshy ground near the Cheesewring, Liskeard, on August 19th, they found four plants of *Malaxis*, one of which was sent to me for identification. The locality is in the Watsonian vice-county 2 (Cornwall East), and in Division 3 of my *Flora*.—F. Hamilton Davey.

Juncoides pallescens O. Kuntze in Surrey (p. 188).—Mrs. Davy, I find, gathered this in the turf which is in the grounds of her residence near Pyrford, and this I have recently examined. This ground has only lately been enclosed from the heathy woodland of the district. The turf contains no alien species, and it is improbable that the plant came in with garden seeds or soil. If not native *in situ*, there is the chance of it being in the turf used to make up the lawn, which doubtless came from the vicinity. The turf is certainly of an ericetal character. We have no evidence that this Wood Rush occurs as an alien species elsewhere in Britain; but it is a highly critical species and may easily be passed over, especially in the late summer, for a form of *J. multiflora*. Its discovery in Surrey and elsewhere in Britain may be safely predicted. Meanwhile, Surrey had better be bracketed for its occurrence. Recently I have seen it at Wood Walton, where it has only been noticed along the tracks cut through the Fen, although it may be hidden in the vegetation. The district of Pyrford has now been largely occupied with residences, so that the area in which the plant might grow is seriously diminished.—G. C. Druce.

Rosa pimpinellifolia L. × rubiginosa L.—On Sept. 17th I had the pleasure of discovering numerous bushes of this rare hybrid on the coast of Haddington, not very far from Port Seton. Scattered along about half a mile were some twenty bushes or rather clumps growing amidst numerous bushes of the parent species. Some clumps of the hybrid were luxuriant, growing to a height of more than eight feet. They were by no means sterile, but bore a fair crop of fruit, though, no doubt, this was only a fraction of what had aborted. There were two strikingly different forms as regards the fruit. One set had a long fruit, oblong or oblong obovoid, whilst the other had it globose urceolate. The latter comprised the large majority of bushes. It is remarkable how such a colony has up till now escaped notice.—William Barclay.

Herniaria hirsuta in Cornwall.—This plant must be added to the long list of aliens recorded for Cornwall. I found it recently at Par growing with *Polycarpon tetraphyllum* and *Polygonum maritimum*, both of which are also new records for vice-county 2 Cornwall East).—F. Hamilton Davey.

REVIEWS.

Edible and Poisonous Fungi.

Edible and Poisonous Fungi. With 25 Coloured Plates. 8vo, pp. 28. Price 1*s*. Office of Board of Agriculture, Whitehall Place, S.W.

[*True and False Mushrooms; being a*] *Guide to Mr. Worthington Smith's Drawings of Field and Cultivated Mushrooms and Poisonous or Worthless Fungi often mistaken for Mushrooms* exhibited in the Department of Botany, British Museum (Natural History). Pp. 24. Two folding plates. Price One Shilling.

The almost simultaneous issue of two popular guide-books dealing with larger fungi in their economic aspect suggests that these neglected members of our native flora are beginning to receive the attention that is their due. Not that they have been altogether neglected—it is many years since Mr. Worthington Smith issued two sheets of drawings illustrating in somewhat vivid colours an edible and poisonous fungi; but there was certainly room for more popular literature, and we need not complain if two public departments supply it.

It is to be presumed that the fact that these are official publications accounts for the mystery which attends their production. We seek in vain to discover the authorship of the first; "the original drawings," we are told, "were prepared by Mr. George Massee, with the assistance of Miss Ivy Massee," but we find no indication as to who wrote the letterpress. On neither publication does any name appear either on wrapper or title-page; as to the latter, it would seem that the chief object of the Trustees of the British Museum, by whose order it is printed, is to prevent anyone being able to purchase it, for neither on the title or wrapper is any indication given of the place of publication. It may be said, of course, that the mention of the Department of Botany indicates that the Guide may be obtained there, but there is nothing to show where that Department is situated or that folk must go to Cromwell Road to get it—a further absurdity connected with British Museum publications being that they are not to be obtained at each of the two centres of Bloomsbury and South Kensington. We say must *go*, for there is no indication of postal address, or of the amount to be sent for postage—we believe the generosity of the Dublin Museum in sending its publications post-free is not emulated by the wealthier London institution. It is not too much to say that the usefulness of the British Museum Guides, cheap and excellent as many of them are, is reduced by one-half through the difficulty first of ascertaining their existence, for they are seldom noticed in the public prints, and next of procuring them when their existence has been ascertained.

Nor is this the only evidence that the Trustees are singularly unversed in the ways of ordinary publishers, who, it may be

supposed, understand their business. In the pamphlet before us, two pages of the wrapper are blank; the third is occupied by information as to when the Museum (the locality of which is nowhere stated!) is open to the public. Now the Trustees issue numerous botanical publications, some dealing with Fungi, and it seems inconceivable that so admirable an opportunity of advertising these at absolutely no cost, and so bringing them before the special public for whom they are provided, should be entirely ignored. We speak the more strongly on this point because we are in a position to know that it has more than once been brought to the notice of those through whose hands the publications pass for press—apparently without result; and we now call attention to the matter in the hope that the public, who really subsidize the Museum Guides, may see that these are published in a manner consistent with ordinary business arrangements. With this preliminary but eminently justifiable grumble, we proceed to examine the contents of the two little books.

The Board of Agriculture is to be commended on the brief and sensible title of its publication, which is in marked contrast to the "breather" which announces the Museum Guide. But the very first line of its "table of contents" gives us pause—why "edible *varieties* of fungi"? Surely they are species? This solecism is of frequent occurrence—*e. g.* on pp. 4, 7, 14, 15, 17, 21—and is used interchangeably with "species." The English throughout is slipshod—*e. g.* "The following method of cooking Morels is given by Dr. Cooke, and the testimony of others corroborates his statements" (p. 20), and the amusing antithesis, "The flavour is excellent, *but* the fungus is not common" (p. 13), reminding one of the phrase, "He was born of poor *but* honest parents."

It may be said, however, that these are small matters and do not militate against the usefulness of the book. Unfortunately more serious criticism is suggested by the extraordinary omissions. We look in vain for the Chantarelle, the Champignon, or the Truffle; for plants which by their very names call for inclusion, such as *Lactarius deliciosus* and *Pleurotus sapidus*; for the two species of *Hygrophorus* (*H. pratensis* and *H. virgineus*); for *Pleurotus ostreatus*, and others that might be named. Among the poisonous species, too, important omissions may be noted—*e. g. Boletus felleus*, often confused with *B. edulis*; various species of *Russula* and *Lactarius*—one of the latter is referred to but not named on p. 15; and *Hebeloma fastibile*, which bears a close resemblance to the mushroom, and is often eaten in mistake for it with fatal results. Such omissions as these, especially the last-mentioned, detract very seriously from the usefulness of the book.

The figures are fairly good, although the omission of any sections showing the attachment of the gills to the stem—a crucial point not even referred to in the descriptions—detracts from their value. That of the Giant Puffball—which by the way is called *L. giganteum*; *L. Bovista* is, we believe, more correct—

is misleading from its small size: some of the accessories—*e. g.* the *Lycopodium* (?) (fig. 19) are curious. On the whole, the book, although useful so far as it goes, cannot be considered satisfactory, and it is to be regretted that Mr. Massee should not have revised the text.

The portentously lengthy title of the Museum Guide—a term which seems rather odd as connected with two sheets of drawings—has induced us to suggest another which is accurate and quotable, and may perhaps be adopted in future issues: a title containing twenty words is not easily remembered. The illustrations to this account of "True and False Mushrooms" are on two folding plates, and, as these reproduce the drawings exhibited, it is not easy to see why the latter should be referred to, unless for some technical Trustee reason with which we are unacquainted. On the first and larger plate, the multiple folding of which is somewhat inconvenient for reference, are figured field and cultivated Mushrooms and their varieties, to the number of sixteen; on the second eleven fungi often mistaken for Mushrooms. The plates are reduced from the large sheets of coloured drawings exhibited in the Department of Botany, where they form a part of the admirable and unique collection of figures of British fungi with which Mr. W. G. Smith has enriched the National Herbarium, and which will always be a monument of his skill as a draughtsman. Each species and variety is technically but clearly described, a general description of the Mushroom preceding the detailed accounts. The mould parasitic on Mushrooms—*Mycogone perniciosa*—is also figured and described. Among the species mistaken for Mushrooms *Hebeloma fastibile* holds a conspicuous place. Mr. Smith's "fifty years' experience as mushroom and fungus referee on the horticultural press" has given him special opportunities for becoming acquainted with a wide range of forms of the Mushroom and its allies, and that knowledge is the basis of the text which he has supplied to accompany his figures.

J. B.

Die Geographie der Farne. Von H. Christ. Pp. 358, 1 pl., 129 text-figures, 3 maps. Jena: G. Fischer. 1910. Price 12*s*.

Of those who are actively engaged in the systematic study of ferns, Dr. Christ, of Basel, doubtless takes the lead. For more than thirty years he has received collections large and small from all parts of the world for determination. And from the examination of this abundant and diverse material he has acquired a multitude of facts and observations relating to the distribution of ferns. This accumulation of knowledge he has pondered over and classified, and now gives to the public in the present instructive work. No such detailed study of fern distribution has ever been published before.

It is a matter of common belief that the ferns, owing to their light and numerous spores, have a more diffuse and wider distribution than the phanerogams. But this is shown by Dr. Christ

to be an error. For, though a good many species do possess a wide general distribution, yet on the whole the ferns do not spread more widely than the phanerogams. They are subject to precisely the same climatic conditions, save that they mostly exhibit a decided preference for woodland habitats, and avoid exposure to strong sunshine. In old days fern-species were more ample conceptions, and included what are now regarded as groups of allied species. Consequently their areas of distribution were much larger. Nowadays the species are smaller and more precise, and consequently have a much more limited distribution, comparable to and parallel with that of the phanerogams. The various regions of the earth have their respective fern floras. Where there is an endemic phanerogamic flora, there also we find endemic ferns; for instance, in New Caledonia, the Sandwich Islands, the Atlantic Islands, and, above all, in West China—a region which Dr. Christ regards as a most important source of the ferns of the Asiatic region.

The ferns, being geologically far older than the phanerogams, might be regarded as being in a decadent condition. But this is by no means the case. They possess a capacity for distribution and for variation of form equal to that of any other group of plants, however modern, such as *Hieracium*, *Rubus*, &c. Among the archaistic types of ferns now existing, some—for instance, *Gleichenia* and *Danæa*—exhibit a bewildering number of forms which present as difficult a problem to the pteridologist as the most variable of the recent genera. There is no question that the ferns as a class possess a powerful vitality. And though in the struggle for existence they are, owing to their need of moisture and shade, unable to compete on equal terms with the phanerogams, yet they often play the part of pioneers, preparing the ground for the higher plants, as has been shown by Treub in his account of the redevelopment of plant-life on Krakatoa.

The following is a brief account of the contents of the book. Part i. treats of the influence of soil and climate upon the ferns:—Edaphic Conditions, Climatic Conditions, Hygrophytes, Xerophytes, Arctic-alpine Ferns, &c. Part ii. is devoted to a discussion of fern floras, prefaced by a consideration of the principles of floristic botany. The regions into which the author divides the fern world are as follows:—(1.) The cold temperate northern forest region. (2.) Mediterranean, with the west coast of Europe and the Caucasus. (3.) China and Japan. (4.) Indo-Malaya and Polynesia. (5.) Australia and New Zealand. (6.) Tropical Africa. (7.) South Africa with the east and west coasts, the African islands of the Indian and Atlantic Oceans. (8.) The dry climes of Mexico and California. (9.) Tropical America, from Mexico to Paraguay. (10.) South Brazilian Campos. (11.) Andes. (12.) South Chile with Juan Fernandez and Antarctica.

A list of literature, arranged geographically, is appended.

A. G.

A Textbook of Botany for Students

WITH DIRECTIONS FOR PRACTICAL WORK

Contents:—Part 1.—General Morphology. Part 2.—Histology. Part 3.—Physiology. Part 4.—Ecology. Part 5.—Systematic Botany

By AMY F. M. JOHNSON, B.Sc.,
Lecturer in Botany at Cheltenham Ladies' College

With Illustrations by W. L. BOYS-SMITH,
Late Scholar of Girton College, Cambridge, and Science Lecturer at Cheltenham Ladies' College.

and E. M. BERRIDGE, B.Sc., F.L.S., and others

Crown 8vo, Cloth. 560 pages. 400 Illustrations. **Price 7s. 6d.**

London: ALLMAN & SON, LIMITED, 67, New Oxford Street, W.C.

FOR SALE.—COMPLETE SET of the 'JOURNAL OF BOTANY' (British and Foreign). Forty-five volumes bound in strong green cloth; 2 Vols. (46, 47) require binding. Apply to:—

ARTHUR BYROM, AINGARTH, STALYBRIDGE.

LEITZ' NEW

LARGE TRAVELLING MICROSCOPE

conforms in its dimensions and general design to model D. It is fitted with the new form of fine adjustment having continuous cam and worm screw movement with milled heads at the sides; a displacement of the graduated drum through one division gives the tube a vertical motion of 0.001 mm. ($\frac{1}{25\frac{1}{400}}$ in.).

Price, complete in case (leather or mahogany), with Abbe condenser, iris diaphragm and worm focussing screw, triple nose piece. objectives $\frac{3}{5}$ and $\frac{1}{6}$, eyepieces 1 and 3 .. .. £12 5 0
Ditto, and $\frac{1}{12}$ oil immersion objective and eyepiece 4 .. .. .. 17 10 0
Ditto, Ditto, and mechanical stage 21 0 0
Ditto, do., do., and dark ground condenser 23 1 0

E. LEITZ, **Oxford House, 9, New Oxford Street, London, W.**

Agents in all University Centres.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of June and July (Double Number).—The Inter-Relationships of the Bryophyta. III.—Anacrogynous Jungermanniales. Inter-Relationships of the Anacrogynæ. (Figs. 30-43), by F. Cavers. Adventitious Budding and Branching in *Cycas*. (Text-Figs. 8–14), by M. C. Stopes. The Rhizophore of *Selaginella*. (Text-Figs. 15, 16), by W. C. Worsdell. Note on a Wounded Myeloxylon. (Text-Figs. 17, 18a, 18b), by H. S. Holden. Two Embryo-Sac Mother-Cells in the Ovule of *Fritillaria*. (Text-Fig. 19), by A. E. Lechmere. The Brussels Congress of Botanists. *Review.*—Seeward's Fossil Plants, by D. H. S.

Subscription-Price, 15*s. per annum* (*ten numbers*) *post free.*
Price of single number, 2*s.* *Price of double number*, 4*s.*

Published Monthly by the Editor, The Botany School, Cambridge.

Demy 8vo. Price 1s. 6d.

Key to Genera & Species of British Mosses

By the Rev. H. G. JAMESON, M.A.

Price 2s. 6d., Postage 2d.

The Subsection Eu-caninæ of the Genus Rosa

By Major A. H. WOLLEY-DOD.

Limp Cloth, 8vo. Pp. 276. Price 6s. net. Postage 3d.

NOTES ON THE

Drawings for Sowerby's 'English Botany.'

By F. N. A. GARRY.

Demy 8vo, 118 pp., Price 3s.

A Supplement to Topographical Botany, Ed. 2.

By ARTHUR BENNETT, F.L.S.

Pp. 32, with 2 Plates, in Paper Cover. Price 2s., postage 1d.

THE BRITISH PANSIES.

By E. DRABBLE, D.Sc., F.L.S.

London: WEST, NEWMAN & CO., 54, Hatton Garden, E.C.

Subscriptions to the Journal of Botany (16s. post free) for 1910 should be sent to West, Newman & Co.

No. 575 NOVEMBER, 1910 Vol. XLVIII

THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

Notes on Japanese *Ranunculaceæ*. By H. Takeda 265

Notes on the Flora of Middlesex. By G. Claridge Druce, M.A., F.L.S. 269

Armeria alpina Willd. in Britain? By H. Stuart Thompson, F.L.S. 278

Note on *Fissidens tequendamensis* Mitt. By H. N. Dixon, M.A., F.L.S. 280

Spiræa Ulmaria L. var. *denudata* Boenn. By G. Claridge Druce 281

Short Notes. — *Hyoscyamus niger* var. *pallidus* — *Tragopogon* Hybrid — *Peloria* State in Foxglove — S. Kerry Plants — *Mentha alopecuroides* Hull. — *Hieracium carenorum* in East Ross 283

PAGE

Reviews :—

Report of the Botanical Exchange Club for 1909. By the Editor and Distributor, S. H. Bickham 285

Bref och skrifvelser af och till Carl von Linné; med understöd af Svenska Staten utgifna af Upsala Universitet 290

Stapelieen und Kleinien einschliesslich einiger anderer verwandta sukkulenten. Von Alwin Berger 293

Étude critique et expérimentale sur le Polymorphisme des Algues. By R. Chodat 294

Book-Notes, News, &c. 295

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1909, bound in cloth, can be had at £1 1s. each.

Cases for binding 1909 volume, and blanks for previous volumes can be had **price 1s. 6d. each.**

AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under: —

2 pages	25 copies	4s.	4 pages	25 copies	5s.	8 pages	25 copies	8s. 0d.
,,	50 ,,	5s.	,,	50 ,,	6s.	,,	50 ,,	9s. 0d.
,,	100 ,,	7s.	,,	100 ,,	8s.	,,	100 ,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles. Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

NOTES ON JAPANESE *RANUNCULACEÆ*.

By H. Takeda.

Thalictrum sachalinense Lecoy. Monogr. Thalictr. p. 77, tab. 3, fig. 6.

Syn. *Thalictrum akanense* Huth in Bull. Herb. Boiss. v. (1897), p. 1069. Boiss. in Bull. Herb. Boiss. vii. (1899), p. 585. Finet et Gagn. Contr. Fl. Asie Orient. i. (1905), p. 48.

Thalictrum aquilegifolium Miyabe in Sched. Herb. Coll. Agr. Satporo, non Linn.

Statura *T. baicalensis* Turcz., sed foliis stipulatis et stipellatis, stipulis integris nec laciniatis, foliolis basi plerumque rotundatis, antheris longioribus, stylis longioribus circinatis, acheniis majoribus bene distinguitur. Caule plerumque robusto 2–3-pedale, raro sesquipedale.

Nom. Japon.: Yezo-karamatsu.

Hab. Yezo: Piroro, prov. Tokapchi; ad radice montis Teine prope Satporo; nec non aliis locis. Kurile: ins. Shikotan. Sachalin.

One of early-flowering species of Japanese Thalictrums. The flowers are large, sepals 4–5, oval, pale purple, stamens numerous, white, filaments clavate-dilated at the apex. There is no doubt that *T. akanense* Huth is conspecific with *T. sachalinense* Lecoy., which was described from the specimens collected by Glehn in the island of Saghalien. Our plant is distributed in the island of Yezo, Kuriles, and Saghalien. No specimens have been collected in the main island of Japan.

Thalictrum minus Linn. var. nanum Lecoy. *l. c.* p. 127. Miyabe, Fl. Kuril. p. 124, excl. syn.

Caulis humilis, 25–50 cm. altus, strictulus vel subflexuosus, foliatus, minute glandulosus. Folia 3-ternata, petiolis plerumque stipellatis, glandulosis, auriculis vaginarum fimbriato-laceratis, foliolis parvis, supra glabris, subtus glaucis, glandulosis. Panicula densa, pedicellis glabris vel sparse glandulosis; floribus pendulis, sepalis lanceolatis, acutis, pallide fusco-virescentibus, glabris; acheniis sessilibus, compresso-ovatis, sparse glandulosis, stigmate angusto.

Nom. Japon.: Hime-akikaramatsu.

Hab. Nippon: in monte Shirouma; in monte Hakkôda. Yezo. Kurile: ins. Shikotan; ins. Kunnashiri.

The characteristics of this variety are a low, somewhat geniculate stem and glandular hairs on leaves as well as branches.

Thalictrum fœtidum Linn. Sp. Pl. p. 545. DC. Prodr. i. p. 13. Ledeb. Fl. Ross. i. p. 7. Turcz. Fl. Baic.-dah. i. p. 30. Regel in Bull. Soc. Imp. Mosc. xxxiv. (1861), p. 44; Pl. Radd. i. pp. 13–14. Lecoy. *l. c.* p. 106, tab. i. figs. 1, 3, 7, tab. iv. fig. 7. Korshinsky in Act. Hort. Petr. xii. (1892), p. 292. Finet et Gagn. *l. c.* p. 59.

Icon. Waldst. et Kit. Descr. Icon. Pl. Rar. Hungar. ii. tab. 174. Reichb. Icon. Fl. Germ. iii. tab. 26.

Var. nov. GLABRESCENS Takeda.

Syn. *Thalictrum fœtidum* Boiss. *l. c.* p. 587.

Caulis tener, subflexuosus, 1–2-pedalis, glabrescens. Folia circumscriptione lato-ovata, petiolis exstipellatis, glabris, auriculis vaginarum integris vel paulo crispulis, quadripinnata, foliolis sub lente supra pilis eglandulosis brevibus et glandulosis brevissimis immixtis sparse obsitis, subtus glaucis, pilis glanduligeris copiose vestitis, tantum in nervis pillis eglandulosis brevibus puberulis. Panicula sublaxa, pedicellis glabris; floribus pendulis, sepalis obovato-oblongis, obtusis, pallide purpureis, glandulosis; acheniis sessilibus, compresso-obovatis, glandulosis, stigmate dilatato.

Arctissime affine var. pilosulo Regel, a qua caule glabro, foliolis subtus dense pilis glandulosis vestitis, in nervis minus puberulis distinguitur.

Nom. Japon.: **Chabo-karamatsu.**

Hab. Yezo: Oshoro; Ranshima, prov. Shiribeshi; Otaru; ad fl. Hacham superiorem; Jôzankei, etc., in rupibus.

This plant is perhaps the prettiest of Japanese Thalictrums. It is often confounded with the above cited *T. minus* var. *nanum* Lecoy. in consequence of its similar habit as well as the presence of the glandular hairs. The leaves of *T. fœtidum*, however, are broader, 4-pinnate, with smaller herbaceous leaflets having nerves deeply sunken on the upper surface when dry, and exstipellate; those of *T. minus* var. *nanum* are triternate, usually stipellate with often fimbriate stipellæ, leaflets larger, subcoriaceous, and nerves not sunken in general cases. In *T. fœtidum* the inflorescence is more lax, sepals longer and pale fuscous-green in colour, the filaments longer, the achenes broader and with larger stigmas. Most of the varieties of *T. fœtidum* have fairly long eglandular hairs on leaves, which are characteristics of this species, distinguishing it from var. *nanum* of *T. minus*.

Anemone (PULSATILLA) **Taraoi** (Makino), Takeda.

Perennis. Folia hysteranthea, initio hirsuta mox glabra, radicalia longe-petiolata, bi-ternata, segmentis circumscriptione lato-ovatis, bi- vel tripinnatifidis, laciniis ultimis lineari-lanceolatis, circa 5 mm. longis, circa 1 mm. latis. Flores ante folia provenientes, cernui, sulphurei, sepalis extus pillis mollibus longis subdense vestitis, intus glabris, multinervosis. Scapus uniflorus, florifer circiter 4 cm. altus, erectus, hirsutus, fructifer elongatus, circa 10 cm. altus, glabrescens. Involucrum trifoliolatum, segmentis sursum in lacinias multas divisis. Pedicellus florifer fere 4 cm. longus pilosus, fructifer valde elongatus 10 cm. longus, glabrescens, apice hirsuto-pubescens.

Species *A. albanæ* (α *flavescenti*) Stev. similis, a qua foliis hysterantheis nec coætaneis, biternatis nec pinnatis, laciniis angustioribus, adulta glabra nec pilosa satis distinguenda est.

α KURILENSIS mihi.

Syn. *Anemone patens* var. *hirsutissima* subvar. *Taraoi* Makino in Tôkyô Bot. Mag. xvii. (1903), p. 39.

Anemone hirsutissima var. *Taraoi* Makino, *l. c.* xviii. p. 69.

Sepalis 10–12, lineari-spathulatis vel angusto-oblongis, obtusis, 22–27 mm. longis, 4·5–8 mm. latis; involucri foliis laciniato-supradecompositis, laciniis ultimis anguste linearibus.

Nom. Japon.: Kataoka-sô.

Hab. Kurile: in monte Shakotanyama, ins. Shikotan; ins. Bratchirnoef; Iyema, ins. Urupp; in port. Browton, ins. Shimushir; ins. Shimushu.

β NIPPONICA mihi.

Syn. *Anemone patens* var. *intermedia* Makino, *l. c.* xvii. p. 39, excl. synon.

Sepalis 6–7, oblongis vel oblongo-obovatis, acutatis, circa 20 mm. longis, circa 10 mm. latis; involucri foliis laciniatis ad-modum folii segmentorum et quam in α latioribus.

Nom. Japon.: Tsukumo-gusa.

Hab. Nippon: in montibus Yatsugatake; in monte Shirouma.

This plant is quite different from *A. patens* or *A. hirsutissima*. The peculiar shape of the leaf is characteristic of this species. The geographical area is confined to the alpine region of high mountains of Central Japan and the Kurile Islands.

AQUILEGIA OXYSEPALA Trautv. et Mey.

α TYPICA.

Syn. *Aquilegia oxysepala* Trautv. et Mey. Fl. Ochot. p. 10. Borbás in Értek. Terméz. Köreböl. xii. (1882), Separ. p. 9. Trautv. in Act. Hort. Petr. viii. (1883), p. 53. Freyn in Oesterr. Bot. Zeitschr. li. (1901), p. 380.

Aquilegia vulgaris var. *oxysepala* Regel, Tentam. Fl. Ussur. n. 26.

Aquilegia Buergeriana Boiss. *l. c.* p. 597, pro parte.

Aquilegia vulgaris Finet et Gagn. *l. c.* p. 156, pro parte, excl. syn. nonnull.

Calcaribus apice valde incurvis.

Nom. Japon.: Yezo-no-yamaodamaki.

Hab. Yezo: Oraporo, prov. Tokapchi; Piroro, ejusd. prov.; secus Ashupet, ejusd. prov.; Satporo; ad pedem montis Teine, prope Satporo; Momchiseunnai, tractus Mukawa, prov. Iburi; Chitose, ejusd. prov.; Saruru, prov. Hidaka; vicinitate Atsubetsu, prov. Ishikari; Sempôji, prov. Kushiro; Nakaware, prov. Nemuro.

β BUERGERIANA (Sieb. et Zucc.) mihi.

Syn. *Aquilegia Buergeriana* Sieb. et Zucc. Fl. Japon. Fam. Nat. i. p. 183. Baker, *l. c.* p. 20. Borbás, *l. c.* p. 10. Huth, *l. c.* p. 1089. Boiss. *l. c.* (pro parte).

Aquilegia atropurpurea Miq. Prol. p. 196. Franch. et Sav. Enum. Pl. Japon. i. p. 12, nec Willd.

Aquilegia vulgaris Finet et Gagn. *l. c.*, pro parte, et excl. syn. nonnull.

Icon. Iinuma, Sômoku Dzusetsu, x. n. 28.

Calcaribus gracilioribus fere rectis apice vix incurvis.

Nom. Japon.: Yama-odamaki.

Forma *a.* DISCOLOR mihi.

Sepalis fusco-purpureis.

Hab. Nippon: tractu Nikkô; "central mountains, 2–7000 ft." (Maries!); prov. Nambu; loco non indicato (Dickins! n. 905).

Forma *b.* FLAVESCENS Makino in Tôkyô Bot. Mag. xxiv. 141 (1910).

Floribus concoloribus, sepalis flavescentibus.

Hab. Nippon: ad radice montis Fuji; in pratis herbosis prope Managashi, prov. Shinano.

I cannot find any specific distinction between *A. oxysepala* and *Buergeriana*; while our plant differs from *A. vulgaris* by having more slender and more leafy stem, only in the uppermost part of which glanduloso-pubescent, leaves glabrous and not pubescent beneath, the lamina of petal nearly quadrate with truncate apex and not rounded, the colour of which is pale primroso-yellow, spur longer than the lamina and as long as the sepal, folicles much more slender, and styles shorter than carpels. Miquel reduced *A. Buergeriana* to *A. atropurpurea*, and Franchet and Savatier followed his opinion. The latter, however, is distinct from the former in having smaller flowers, petals of which are rounded in shape and dark purple in colour, much longer styles, and leaves pubescent beneath. On account of the glandular hairs on stems as well as folicles, *A. Buergeriana* was taken for *A. glandulosa* Fisch. by some botanists. *A. glandulosa*, however, is different from it in having lower and almost leafless stems with fewer and much larger flowers, the sepals of which are more than 4 cm. long, nearly 3 cm. broad, bluish violet in colour, petals of white colour, very small and rounded, spur short and much incurved, leaves pubescent beneath.

In the flora of Japan the typical *oxysepala* is distributed in the island of Yezo, while var. *Buergeriana* is found abundantly in the mountainous districts of the main island.

CIMICIFUGA FŒTIDA Linn. Syst. Nat. ed. 12, p. 659. Huth in Engl. Bot. Jahrb. xvi. p. 317.

Var. RACEMOSA Regel, Pl. Radd. i. p. 121. Huth, *l. c.*

Planta fere bipedalis, caule petiolisque hirsutis. Folia bi- vel tripinnata, foliolis ovatis, incisis, terminalibus trilobatis. Racemus abbreviatus, simplex, circa 10 cm. longus, rhachi pubescenti, floribus breviter pedicellatis, petalis apice sæpe emarginatis, antheroideis, staminodiis nullis, carpellis junioribus villosis, breviter stipitatis, stipite suo triplo longioribus, maturis hirsutis, seminibus dense squamatis.

Hab. Yezo: insula Rishiri; Kameda, prov. Oshima. Kurile: Anama, ins. Shikotan; Tokkarimasuba, ejusd. ins.; Onnepet, ins. Eturup.

New to the flora of Japan. This variety is distributed in Eastern Siberia and Sajanian Mountains, about 2300 m. above the sea-level.

Var. NOV. LEIOGYNA mihi.

Caulis 4- fere 9 dm. altus. Folia ternata, segmentis iterum bipinnata, foliolis omnibus plus minusve petiolulatis, ovatis, lobato-vel inciso-dentatis, subtus in nervis pilosis. Racemus terminalis

simplex, 10–20 cm. longus, floribus longe pedicellatis, pedicellis basi squamis minutissimis bracteolatis, petalis apice leviter bifidis, antheroideis, carpellis 3–5, glabris, stipitatis, stipitem subæquantibus. Carpella matura non vidi.

Hab. Nippon: in sylvaticis supra 1600 m. montium Hôwôzan, prov. Kai; in monte Omine, prov. Yamato.

This variety differs from var. *Tschonoskii* Matsum. & Nakai of this species (Tôkyô Bot. Mag. xxii. p. 151) in smaller size, simple raceme, carpels longly stalked and less in number. It reminds one of *C. americana* Michx. in its long-stalked glabrous carpels, from which our plant is readily distinguished by having leaflets pilose on nerves beneath, bracteoles smaller.

NOTES ON THE FLORA OF MIDDLESEX.

By G. Claridge Druce, M.A., F.L.S.

The following material has been obtained during the past fourteen years, which have been spent in investigating the flora of the bordering county of Bucks. As closer attention is now paid to introduced species than was formerly the case, I have included a somewhat large number of casuals, which are especially to be found about the refuse from the street-sweepings of the metropolis near the brickyards of Drayton, &c. In addition to my own records, I have included such as are to be found in the herbarium of the late Mr. A. Loydell, which has come into my possession; these have *L.* appended. It includes two or three additions to the indigenous flora of the county, as well as other interesting gatherings; his Mosses and Liverworts have yet to be examined. * indicates a presumed new county record; † an introduction. The numbers preceding the locality refer to the districts of Trimen & Dyer's *Flora of Middlesex*.

Thalictrum flavum L. 1. Denham.—†*Anemone apennina* L. 7. Ken Wood. — *Myosurus minimus* L. 1. 'Juxta Uxbridge,' *Sibth. MS.* 1780. — *Ranunculus Drouetii* F. Schultz. 2. Poyle. 5. Acton, *L.*—*R. heterophyllus* Weber. Hampstead, *Dillen. Herb.* —*R. circinatus* Sibth. [7. Isle of Dogs, *Dillen. Herb.*] 2. Poyle. —*R. pseudo-fluitans* Syme. 7. Hounslow Heath River, *Dillen. Herb.*— *R. fluitans* Lam. 2. Drayton. — *R. Steveni* Andrz. 1. Uxbridge. 2. Colnbrook. — *R. Boræanus* Jord. 7. Hackney Marsh, *Dillen. Herb.*

Chelidonium majus L. 4. Harrow Weald, *L.* -- †*Capnoides lutea* (L.). 2. Waste ground, Teddington, *L.*—†*Fumaria agraria* Lag. 2. Waste heaps, Drayton.—*F. densiflora* DC. 1. Near Uxbridge. 2. Drayton; Harmondsworth.

†*Hesperis matronalis* L. 1. Near Uxbridge. — *Radicula sylvestris* Druce. 5. Apperton, *L.*—*R. palustris* Moench. 1. Harefield Chalk Pit, *L.* 2. Drayton.—*Cardamine hirsuta* L. 1. Uxbridge. 2. Drayton. — *C. amara* L. 2. Drayton. — *Sisymbrium officinale* Scop. var. *leiocarpon* DC. 1. Uxbridge. 2. Near Drayton. — *S.*

Sophia L. 2. Not uncommon on the rubbish-heaps, &c., near Drayton. 5. Apperton, *L.*—†*S. Læselii* L. 5. Sub nom. *Brassica Napus*, Park Royal, Acton, *L.* — †*S. altissimum* L. 2. Drayton. 3. Southall.—†*Wilckia maritima* Scop. 5. Twyford, by the canal, *L.* — *Brassica Rapa* var. *Briggsii* Wats. 2. Drayton. — †*B. elongata* Ehrh. 2. Drayton.—*Diplotaxis muralis* DC. var. *Babingtonii* Syme. 2. Drayton.—†*Eruca sativa* Dill. 2. Drayton.—†*Alyssum incanum* L. 2. Drayton. — †*Lepidium Draba* L. 1. Uxbridge. 2. Drayton.—*L. ruderale* L. 1. Near Uxbridge. 2. Drayton. 3. Hayes. — †*L. sativum* L. 2. Drayton. 5. Acton, *L.* 7. Kingsway, *G. Talbot.* — *Thlaspi arvense* L. 1. Near Uxbridge. 5. E. Acton, *L.* — †*Cochlearia Armoracia* L. 2. Drayton; Hayes.—†*Camelina sativa* Cr. 1. Uxbridge, *L.*—†*Bunias orientalis* L. 3. Between Hayes and Southall. 5. Acton, *L.*—†*Rapistrum rugosum* Berg. 2. Drayton.—†*Raphanus sativus* L. 2. Drayton.

Polygala vulgaris L. Hammer Wood, *L.* 1. Uxbridge Meadows.

†*Reseda alba* L. 5. Acton Green, *L.*—†*R. odorata* L. 1. Uxbridge, *L.*

†*Saponaria Vaccaria* L. 2. Drayton. 6. Crouch Lane.—†*Silene anglica* L. 5. Dust-heap, Acton, *L.* — *S. latifolia* R. & B. var. *hirsuta* Druce. 1. Harefield.—*L. dioica* × *alba*. 1. Harefield.—*L. Githago* Scop. 5. Acton, *L.* — *Sagina apetala* Ard. 1. Uxbridge. 2. Drayton.—*S. Reuteri* Boiss. 2. Drayton.—*S. subulata* Presl. 1. Ruislip Common, 1908, *L.* Not seen by the authors of *Fl. Middl.* in the county. — *Arenaria leptoclados* Guss. 1. Harefield; Uxbridge. 2. Colnbrook. 7. Near Kenwood. — *Stellaria Boræana* Jord. First record: "Hæc passim circa Londinum Januario exeunte & Februario in muris floret .... estque valde præcox et parva," *Dillen. Herb.* p. 151. 1. Cowley; Harefield.—*S. media* With. var. *decipiens*. 4. Edgeware, *L.* — *S. palustris* Retz. 1. Opposite Denham. — *S. graminea* L. 6. Finchley, *L.* —*S. aquatica* Scop. 1. Uxbridge. 2. Colnbrook. — *Cerastium vulgatum* L. var. *hirsutum* (Fries). 2. Near Colnbrook.—*C. arvense* L. 2. "Upon ye banks of ye Thames half a mile beyond Kingston going to Staines," *Littleton Brown in Dillen. Herb.* Earliest record.

†*Claytonia perfoliata* L. 4. Stanmore, *L.*

Malva rotundifolia L. 3. Southall, *L.* 5. Acton, *L.* — †*M. pusilla* With. 1. Drayton. 5. Acton, *L.*—†*M. crispa* L. 5. Acton Green, *L.* — †*Lavatera punctata* All. 5. Acton, *L.* — †*Hibiscus Trionum* L. 5. Acton Wells, *L.*

Hypericum Androsæmum L. 1. South Mimms, *L.* — *H. perforatum* L. var. *angustifolium* Gaud. 1. Harefield, *L.*

Acer campestre L. var. *leiocarpum* Wallr. 1. Near Harefield.

Geranium pratense L. First record, Twickenham, *Hill, Herbal*, 1756.—†*G. macrorhizum* L. 2. Hampton towards Kingston, *L.*—*G. pyrenaicum* Burm. f. 1. Between Uxbridge and Harefield.—*G. pusillum* L. 1. Uxbridge, *L.* 2. Drayton. — *G. columbinum* L. [7. By the side of the road from Gray's Inn Lane], *Hill, Herbal*, 1756. — *G. rotundifolium* L. var. *alba*. 7. By the lead mines on Hackney River, *Hill, l. c.*

†*Linum usitatissimum* L. 1. Uxbridge. 2. Drayton, common. 5. Acton, *L.*

†*Impatiens biflora* Walt. 1. Uxbridge, &c. 2. Drayton, and at intervals along the stream to the Thames ; quite naturalized.

Euonymus europæus L. 1. Ickenham, *L.* 2. Near Colnbrook.

Rhamnus catharticus L. 2. Shepperton, *L.*; Drayton. — *R. Frangula* L. Stanmore, *Lady Aylesford*, 1815, *Hb. Druce*; Ruislip, *L.* 2. Shepperton, *L.*

Cytisus scoparius Link. First record. 7. "In ericeto Hampstediano," *Dillen. Herb.* p. 153.—†Var. *Andræanus* (Pousset). 5. Hanwell Railway bank, *C. B. Green in Hb. L.*—*Genista tinctoria* L. 1. Pinner Hill, *C. B. Green in Herb. L.*—†*Trigonella Fœnum-græcum* L. 2. Drayton.—†*T. Besseriana* Ser. 2. Drayton.—†*T. Melilotus-cærulea* Druce. 5. Acton, *L.*— †*Medicago sativa* L. 1. Harefield. 2. Harmondsworth.—†*M. Falcata* L. 3. Southall.—†*M. denticulata* Willd. 2. Drayton. 6. Crouch End, *L.* — †*M. apiculata* Willd. 2. Drayton.—†*M. arabica* Huds. 5. Acton, *L.*—*M. lupulina* L. var. *Willdenowiana* Koch. 1. Uxbridge, *L.*—*Melilotus arvensis* Wallr. 1. Harefield, *L.* 2. Drayton. 5. Acton, *L.*—*M. officinalis* Willd. 2. Drayton.—†*M. alba* Desr. 2. Drayton. 3. Southall. 5. Acton, *L.*—†*M. indica* All. 2. Drayton. 6. Crouch End, *J. Cooper in Hb. L.* — †*Galega officinalis* L. 1. In a hedge in Uxbridge Meadows, *L.*, 1903.—*Trifolium pratense* L. var. *parviflorum* Bab. 2. Staines, *C. B. Green.* 5. Park Royal, *L.*—†Var. *americanum* Harz. Near Harefield.— *T. ochroleucon* Huds. 3. Southall, on waste ground, *L.*, 1903. 6. Finchley, *Cooper*, 1907, *in Hb. L.*—*T. arvense* L. 5. East Acton, *L.*—*T. striatum* L. 4 or 5. Stonebridge Park, Willesden, 1898, *L.*—†*T. hybridum* L. 1. Uxbridge. 2. Twickenham, *L.* Colnbrook. —†*T. resupinatum* L. 5. Apperton, *L.*—*T. filiforme* L. 5. Acton, *L.*—*Anthyllis Vulneraria* L. 2. On the railway bank betweer Colnbrook and Drayton. — *Vicia Cracca* L. First record (see Johnson, "circa Hampsted," 1629).— †*V. villosa* Roth. 2. Drayton. 4. Stanmore, *L.* — Var. *glabrescens* Koch. 2. Drayton.— †Var. *Boissieri* Heldr. & Sart. 5. Acton, *L.*, 1907.—†*V. varia* Host. 2. Drayton.—†*V. lutea* L. 2. Drayton, 1890.– †*V. pannonica* Crantz var. *purpurascens* DC. 5. Acton, 1907, *L.*—†*V. Faba* L. 1. Uxbridge. 2. Drayton.—†*V. sativa* L. 1. Uxbridge. 2. Drayton ; Colnbrook.—*V. sepium* L. 5. Twyford Abbey, *L.*—*V. angustifolia* L. 1. Near Ruislip, *L.* 2. Drayton. 5. Acton, *L.*—†*V. Ervilia* Willd. 5. Acton, 1907, *L.*—†*Cicer arietinum* L. 5. Acton, 1901, *L.* — †*Lathyrus Aphaca* L. 1. Uxbridge. 2. Drayton. — †*L. Clymenum* L. and †*L. annuus* L. 2. Drayton.— †*L. hirsutus* L. 1. Uxbridge (as *L. tuberosus*), *L.* 6. Crouch End, 1897, and East Finchley, *Cooper in Hb. L.*—*Ornithopus perpusillus* L. Hyde Park, plentifully, *Hill, Veg. Syst.* xxii. 1773; Dawley, *L.*—†*Pisum arvense* L., †*P. sativum* L., and †*Phaseolus vulgaris* L. 2. Drayton.

Prunus insititia L. 1. Pinner, *L.* 2. Dawley, *L.*; Drayton. — †*P. Padus* L. 2. Hedge, Colnbrook, Middlesex, *L.* Alien, of course. — *P. avium* L. Stanmore Heath, *L.* On a willow

near Harefield.—*Spiræa Ulmaria* L. var. *denudata* Boenn. 5. Greenford, *L.*—†*S. salicifolia* L. 4. Scratchwood, *L.*—*Alchemilla alpestris* Schmidt. 4. Stanmore Common, *C. B. Green in Hb. L.* —*A. vulgaris* var. *minor* Huds. 1. Field between Denham and Uxbridge.—†*Potentilla recta* L. 5. Ealing, *L.*, 1905.—*P. erecta* × *procumbens*. 4 or 5. Near Stonebridge Park, *L.*—†*P. norvegica* L. 2. Drayton. 5. Hanwell, *L.*; Willesden, 1901, *L.*—*P. procumbens* Sibth. 1. Ruislip, *L.*—†*Rubus laciniatus* Willd. 2. Teddington, *L.* Garden escape.—*Fragaria vesca* L. var. *sylvestris*. 5. Near Hanwell, *L.*—**Geum rivale* L. Near Colnbrook, *A. Wallis*. New county record.—*Rosa villosa* L. Doubtless all the Middlesex tomentose roses go under aggregate *R. mollissima* Willd., which was first recorded by Dillenius, being found by S. Dale in Bishopwood, and by himself near London. 3. Stanmore, *L.*, is aggregate *tomentosa*, teste *A. Ley*.—*R. Eglanteria* L. First record, Hounslow, *Dillen. Herb.*—*R. dumetorum* Thuill. About London, *Dillenius*, as "Rosa flore albo majore."—*R. systyla* Desv. 1. Between Uxbridge and Harefield, 1892. There is a specimen labelled *R. arvensis* from 1. Northwood in *Loydell's Herb.*—*R. arvensis* Huds. var. *major* Coste. 1. Harefield, *L.*—*R. canina* L. var. *ramosissima* (Reu.). 5. Twyford, *L.*—Var. *vindicata* (Puget). 5. Twyford, *L.*—Var. *dumalis* Bechst. 1. Harefield. 3. Stanmore, *L.*—Var. *jactata* (Déség.). 3. Stanmore. 4. Bentley Priory, *L.*—Var. *Gabrælis* (F. Gér.). 4. Bentley Priory, *L.*—Var. *Amansii* (Déség. & Rip.). Willesden Lane. Major Wolley-Dod has kindly named the Roses.—*Cratægus oxyacanthoides* Thuill. 1. Not unfrequent in the Denham Meadows.—*C. Oxyacantha* L. *var. *cuneata* mihi. Style 1; calyx pubescent; leaves cuneate, narrow oval oblong, cut at summit into 3–4 shallow segments. 1. Uxbridge Meadows, also at Ashridge Park, Herts, 1900.—*Pyrus communis* L. var. *Pyraster*. 2. Hedge between Hampton and Kingston, *L.*—*P. Malus* L. var. *mitis* Wallr. 5. Apperton, *L.*—*P. Aucuparis* L. 4. Wembley Park, *L.*—*P. torminalis* Ehrh. 4. Bishop's Wood, *L.*

Epilobium angustifolium L. The original record runs :—"Near Cane-wood at Hampstead there is a hedge decorated with it for 80 yards together," *Hill, Herbal*, p. 14, 1756. 4. Scratchwood, *L.* 5. Acton Wells, an escape, *L.*—*E. hirsutum* × *parviflorum*. 2. Drayton.—*E. parviflorum* Schreb. 1. Near Drayton; Scratchwood, *L.*—*E. tetragonum* L. 2. Drayton; Colnbrook.—*E. Lamyi* F. Schultz. Brickfield, Middlesex, *Haussk. Mon.* p. 107, 1884.—*E. palustre* L. First record, Hampstead Bog, *Dillen. Herb.*—†*Œnothera Lamarkiana* Ser. 2. Drayton. 3. Southall.—*Œ. biennis* L. 2. Drayton.

Myriophyllum alterniflorum DC. 1. Uxbridge, near Denham.

Ribes Grossularia L. 2. On a pollard willow, Drayton.—*R. nigrum* L. 2. Teddington, *L.*—*R. rubrum* L. 1. Harefield, 1903, *L.*; Denham by the river.

†*Sedum reflexum* L. Laleham, *L.*—†*S. spurium* Bieb. 2. Colnbrook, *L.*

†*Carum Petroselinum* B. & H. 2. Between Drayton and Har-

mondsworth; rather commonly in arable fields.—†*C. Carvi* L. 4. Near Muswell Hill on railway, *Cooper in Hb. L.* — *Apium nodiflorum* Reichb. 1. Uxbridge, *L.* 2. Drayton.—*Pimpinella Saxifraga* L. var. *dissecta* With. 1. Harefield, *L.* — †*Bupleurum rotundifolium* L. 1. Near Uxbridge, near the Mill, 1902. 2. Yewsley, in cultivated fields, 1908, *L.* — *Œnanthe fistulosa* L. 1. Near Denham. 2. Drayton.—*Œ. crocata* L. 1. "Out of the tail of Biggs Mill near Cowley," *Lightfoot MS.* 2. Drayton; Colnbrook.—*Œ. aquaticum* Poir. 5. Greenford Green, *L.*—*Œ. fluviatilis* Colem. 1. Uxbridge. 2. Drayton; Colnbrook.—*Anthriscus Scandix* Beck. 2. Drayton. — *Conium maculatum* L. 5. Apperton, *L.*—†*Fœniculum vulgare* Miller. 2. Drayton.—†*Coriandrum sativum* L. 2. Drayton. 5. Acton, *L.* — †*Caucalis daucoides* L. 1. Uxbridge, *L.*

Viburnum Lantana L. 2. Staines Moor, *L.*—*V. Opulus* L. 2. Colnbrook.—*Lonicera Periclymenum* L. 1. On a willow near Denham.—†*Symphoricarpos racemosus* Michx. 3. Pinner; Sudbury, *L.*

†*Asperula arvensis* L. Finchley, E., 1908, *Cooper in Hb. L.*—*Galium uliginosum* L. 1. Near Denham.— *Valeriana dioica* L. 1. Uxbridge Meadows. 2. Poyle; Drayton. — *V. sambucifolia* Mikan. 1. Near Denham. 2. Poyle.

†*Dipsacus fullonum* L. var. *sativum.* 1. Uxbridge, *C. B. Green*, 1907, *in Hb. L.* — †*Cephalaria syriaca* Schrad. 1. Side of canal, Uxbridge, 1905, *L.*

†*Erigeron canadensis* L. 1. Yewsley, *L.* 2. Drayton. 3. Southall.—†*E. strigosus* Muhl. = *E. Beyrichii* Hort. 5. Acton roadside, 1908, *L.*—†*Inula Helenium* L. 1. In rough pasturage, Northwood, *C. B. Green*, 1909, *in Hb. L.*—*Pulicaria prostrata* Aschers. 5. Shepherd's Bush to Hammersmith, *Hill, Veg. Syst.* 1772.—*Bidens tripartita* L. 5. Apperton, *L.*—*B. cernua* L. 5. Osterley Park, *L.*—*Achillea Ptarmica* L. Willesden, *L.*—*Anthemis arvensis* L. First record, near Kentish Town, *La Gasca*, 1827. — †*A. tinctoria* L. 1. Uxbridge, *L.* 5. Apperton, *L.*—†*Ambrosia artemisiifolia* L. 2. Drayton. — †*A. trifida* L. var. *integrifolia* Willd. 1. Uxbridge, 1908, *L.* — †*Helianthus annuus* L. and *H. tuberosus* L. 2. Drayton. — †*Matricaria suaveolens* Buch. 2. Drayton, 1902. 2. Colnbrook. — *M. inodora* L. var. *discoidea.* 2. Hayes, *L.*—†*Chrysanthemum frutescens* L. 5. Acton Wells, *L.* — *C. coronarium* L. 1. Uxbridge, *L.*, 1903. — *C. segetum* L. A single dwarfed specimen from 5. Acton, labelled *Cotula coronopifolia* in *Hb. L.*—*Tanacetum vulgare* L. 2. Hayes, *L.* — *Gnaphalium sylvaticum* L. 2. Waste ground, Yewsley, *L.*—*Senecio sylvaticus* L. 2. Drayton. — *†*S. squalidus* L. 2. Hayes. 3. Southall. First recorded by the writer.—*S. Jacobæa* L. 1. Uxbridge.—*S. aquaticus* Hill. 1. Uxbridge. — *Arctium majus* Bernh. 1. Uxbridge. 2. Drayton, *L.* — †*Centaurea melitensis* L., *C. Adami* Willd., and *C. raphanifolia* Salzm. 2. Drayton.—*C. Calcitrapa* L. 1. Tyburn, Hammersmith, *Hill, Veg. Syst.* 1772. — *Carduus acanthoides* L. 1. Uxbridge. 5. Park Royal, *L.* — *Cirsium setosum.* 1. Uxbridge. 5. Chiswick, *L.*—*Hypochœris radicata* L. First recorded by *La Gasca*, 1827.—*Cichorium Intybus* L. 1. Uxbridge.

Leontodon autumnalis L. 1. Uxbridge. 2. Colnbrook. 5. Willesden, *L.* — *Tragopogon pratense* L. var. *minor*. 2. Poyle. — *Helminthia Echioides* L. 5. Acton, *L.* First recorded by Turner from between Sion and Branfurd; see *Herbal*, 1551.—*Lactuca virosa* L. 5. Between Smallborough Green and Brentford, *Lightfoot MS.* 6. Enfield.—†*L. Serriola* L. 5. Dust-heap, Acton, *L.*—*Sonchus arvensis* L. 3. Southall. 5. Hanwell, *L.* — *Crepis biennis* L. 1. Field near Harefield. 4. Stanmore, *L.*—*C. taraxacifolia* Thuill. 1. Harefield; Uxbridge. 2. Drayton. 3. Southall. 7. Field in Ken Wood.—†*Carthamus tinctorius* L. 2. Drayton. —†*Calendula officinalis* L. 2. Drayton. — *Hieracium scanicum* Dahlst. 1. Uxbridge.—*H. sciaphilum* Uechtr. 4. Bishop's Wood, *Dillen. Herb.*; Battlewell, *L.*—*H. aurantiacum* L. 6. Southgate, on old wall, *L.*—*H. maculatum* Sm. 2. Twickenham, *L.*—*H. umbellatum* L. var. *coronopifolium* Fr. 3. Hounslow, *L.*—*H. boreale* Fr. 2. Dawley, *L.*; approaching var. *Hervieri* Arv.-Touv. 3. Hounslow, *L.*—†*Xanthium Strumarium* L. 5. Acton Green, *L.*—*X. spinosum* L. 2. Drayton.

Campanula latifolia L. 1. Side of hedge, South Mimms, *L.*, thus giving a definite Middlesex locality.—*Legousia hybrida* Del. 1. South Mimms, *L.*—*Ligustum vulgare* L. 5. Greenford, *L.*

†*Vinca major* L. 3. Isleworth, *Dillen. Herb.*

Gentiana Wettsteinii Murbeck. 1. Harefield, *De Crespigny in Wettsr. Mon.* p. 32. — *Menyanthes trifoliata* L. 2. Near Drayton.

†*Borago officinalis* L. 1. Uxbridge. 2. Drayton. 5. Acton, *L.* —†*Anchusa officinalis* L. 2. Drayton. 6. E. Finchley, *L.*—†*A. italica* Retz. 2. Drayton. — *Symphytum officinale* L. var. *patens* (Sibth.). 1. Near Denham. 5. Ealing, *L.* — †*Lappula echinata* Gilib. 1. Uxbridge, *L.* 2. Drayton. — *Myosotis cespitosa* Schultz. First record, Hounslow, *Dillen. Herb.* p. 75.—†*M. dissitiflora* Baker. 2. Cultivated ground, Dawley, *L.*

Solanum nigrum L. 2. Drayton. 5. Acton, *L.* — †*Datura Stramonium* L. 1. Uxbridge. 2. Drayton. 5. Acton, *L.*—†*D. Tatula* L. 2. Drayton. — †*Lycopersicum esculentum* Hill. 2. Drayton.

Lathræa Squamaria L. 2. Colnbrook, *L.*, 1908.

Linaria minor Mill. 2. Drayton.—**L. repens* Mill. 5. Railway, Acton, *L.*, 1902. New county record. Doubtless introduced by the railway.—†*Mimulus moschatus* Dougl. 1. Side of Colne, Uxbridge, *L.*—*Pedicularis palustris* L. 1. Uxbridge Moor, *L.*—*Euphrasia nemorosa* H. Mart. 1. Harefield, *Dillen. Herb.*; Uxbridge. — *E. Rostkoviana* Hayne. Hampstead, *Dillen. Herb.* 1. Uxbridge. 2. Drayton. — *Veronica montana* L. 3. Hanwell, *L.*

†*Mentha spicata* L. 2. Dawley, *L.*; Stanwell Moor (as *sativa*), *L.*—*M. aquatica* L. var. *major* Sole (*pedunculata* Pers.). Southgate, *Dillen. Herb.* p. 76. — †*Salvia verticillata* L. 2. Drayton. 5. (as *S. clandestina*) Ealing, *L.*—†*S. officinalis* L. 2. Cultivated fields between Hayes and Dawley, *L.* — †*Leonurus Cardiaca* L. 5. Acton Green, 1900, *L.*, a form with leaves more deeply cut.—

Lamium amplexicaule L. 2. Drayton. 5. Acton, *L.*—*L. purpureum* L. var. *decipiens*. 1. About Uxbridge.—†*L. maculatum* L. 2. Twickenham, *L.*—Var. *lævigatum* (L.). Prope London *Dillen. Herb.*—*Galeopsis intermedia* Vill. 2. Drayton; Harmondsworth. Not in *Flora.*—†*Stachys annua* L. 5. Near Willesden Junction, *L.*—*Ballota nigra* L. var. *borealis* (Schweig.) (as *B. nigra*). 5. Acton, *L.*—†*Marrubium vulgare* L. 2. Drayton; alien.

Utricularia vulgaris L. 2. Hampton Court Pond, *L.*, 1903, sub nom. *Pilularia*; the specimen is barren, so it may prove to be *U. major*. Not recorded for the county since 1778.

Hottonia palustris L. St. George's Fields, *Gerard*, p. 679, 1597.—*Lysimachia vulgaris* L. 5. Osterley Park, *L.*—*Anagallis femina* Miller. 2. Drayton.—*Centunculus minimus* L. 2. Between Colnbrook and Cranford, *Lightfoot MS.*

Plantago media L. 2. Drayton.—*P. intermedia* Gilib. 1. Uxbridge. 2. Drayton; Shepperton, *L.*—†*P. Lagopus* L. 2. Drayton.—*P. ramosa* Aschers. 2. Drayton. 5. Acton Wells, *L.*

†*Amaranthus Blitum* L. St. George's Fields, Chelsea, *Dillen. Herb.*—†*A. caudatus* L. 2. Drayton.—†*A. retroflexus* L. 2. Drayton. 5. Acton, *L.*

Chenopodium polyspermum L. 5. Hanwell, *L.*—*C. album* L. var. *viride* (L.). 2. Drayton.—†*C. leptophyllum* Nuttall. 2. Drayton.—†*C. opulifolium* Schrad. 1. Near Denham. 2. Drayton. Thoroughly established in the county.—*C. murale* L. 2. Drayton. First record, see *Ray Syn.* p. 154, 1726.—*C. serotinum* L. 2. Drayton; near Colnbrook; Hayes, *L.*—*C. rubrum* L. 1. Uxbridge. 2. Drayton; near Syon House, *L.*; Hadley Wood, *L.*—†*C. glaucum* L. 6. Muswell Hill, *L.*—*C. Bonus-Henricus* L. 5. Acton, *L.*—†*Beta vulgaris* L. 2. Drayton; Hackney Marshes, *L.*—†*Atriplex littoralis* L. 2. Drayton, rubbish-heaps. 5. Chiswick, *L.* A curious alien.—*A. patula* L. 1. Uxbridge. 2. Drayton. 5. Acton, *L.*—*A. deltoidea* Bab. 1. Uxbridge, *L.*; near Denham. 2. Drayton. 7. Camden Town. Earliest record, *La Gasca*, 1827.—*A. hastata* L. 1. Yewsley. 2. Drayton. 5. Acton, *L.* Prope London, *Dillen. Herb.*—†*A. tatarica* L. 2. Drayton.—†*A. hortensis* L. 2. Drayton, and var. *rubra*. 5. Acton, *L.*

†*Dondia maritima* Druce. Waste ground, Hackney Marsh, 1909, *L.*

Rumex Hydrolapatheum Huds. 2. Poyle. 5. Apperton, *L.*—*Polygonum lapathifolium* L. 1. Uxbridge. 2. Drayton.—*P. tomentosum* Schrank. 1. Near Uxbridge. 2. Drayton.—*P. mite* Schrank. 2. Drayton. 7. Chelsea, *Dillen. Herb.*—*P. Convolvulus* L. 1. Uxbridge. 6. E. Finchley, *L.*—Var. *subalatum* Van Hall. 1. Uxbridge. 2. Drayton. 5. Acton, *L.*

Euphorbia exigua L. 5. Acton Park Royal, *L.*

Callitriche obtusangula Le Gall. (not in *Fl. Middl.*). 1. Uxbridge; Harefield. 2. Poyle; Colnbrook, 1900; Drayton; near Staines.—*C. stagnalis* Scop. 2. Staines (as *hamulata*), *L.* 5. Acton, 1901 (as *Peplis Portula*), *L.* 6. Near Highgate. 7. In Ken Wood.—Var. *platycarpa* (Kuetz). 2. Drayton, 1900.

†*Urtica pilulifera* L. Waste ground, Acton Green, *L.*, 1901.—*U. urens* L. 2. Poyle; Drayton.—*U. dioica* L. var. *angustifolia* W. & G. 2. Drayton. — †*Cannabis sativa* L. 1. Uxbridge; Harlesden, *L.*—*Humulus Lupulus* L. 1. Uxbridge, *L.* 2. Drayton; Colnbrook. — *Salix viridis* Fries, *S. alba* L., and *S. fragilis* L. All near 2. Drayton. — *S. triandra* L. 1. Near Uxbridge. 2. Drayton.—*S. purpurea* L. 1. Uxbridge. 2. Poyle.—*S. viminalis*. 1. Uxbridge. 2. Poyle. 7. Hampstead.—†*Populus alba* L. 5. Twyford, *C. B. Green*, 1905. — *P. canescens* Sm. 1. Near Denham.—†*P. deltoidea* Marsh. 1. Near Uxbridge. 2. Drayton. —†*Castanea sativa* Mill. Winchmore Hill Wood, *L.*—*Quercus sessiliflora* Salisb. 1. Pinner.

†*Taxus baccata* L. 1. Ruislip, *L.* 4. Stanmore, *L.*; planted.

Hydrocharis Morsus-ranæ L. 2. Poyle. — *Orchis latifolia* L. 1. Near Uxbridge.

**Habenaria viridis* Br. (not in *Fl. Middl.*). 1. Field between Harefield and Northwood, 1906, *C. B. Green in Herb. L.*—*Helleborine media* Druce. Harefield, *C. B. Green*, 1909; Ickenham, *L.*

Narcissus Pseudo-Narcissus L. 1. Ruislip, *L.*—*N. incomparabilis* Mill. Hornsey Churchyard, see *Dillen. Herb.* p. 113; not *N. biflorus*, as in *Fl. Middl.*, unless both species grew there.

Unifolium Bifolium Kuntze. Still in its old habitat, 1909.—*Scilla autumnalis* L. 2. The Park, Hampton Court, 1909, *C. B. Green in Herb. L.*

Juncus articulatus L. 1. Uxbridge. — *Juncoides campestre* Morong. St. George's Fields, *Gerard Herb.* 1597.—*J. multiflorum* Druce. 1. Harrow Weald, and var. *congestum*, *L.*

Typha angustifolia L. 1. Pinner Hill, *C. B. Green*, 1908. 2. Drayton. — *Sparganium neglectum* Beeby. 1. Near Uxbridge. 2. Drayton.

Lemna trisulca L. 2. Drayton. 4. Edgeware, *L.*—*L. gibba* L. 2. Poole. 7. Hackney Marshes, *L.* — *L. polyrhiza* L. 1. Harefield, *L.* 2. Poyle.

Potamogeton natans L. 2. Poyle. 5. Perivale, *L.* — *P. polygonifolius* Pourr. 7. Hounslow, *Dillen. Herb.* — *P. crispus* L. 1. Uxbridge. 2. Drayton; Poyle. — *P. pusillus* L. 2. Bushey Park, as *pectinatus*, 1903, *L.*—*P. interruptus* Kit. First record, Hackney Marsh, *Dillen. Herb.* 2. Drayton. — *P. pectinatus* L. 3. Southall (as *pusillus*), *L.*—*P. pusillus* L. var. Queen's River, Bushey Park, *L.*, as *pectinatus*.

Eleocharis acicularis Br. 1. Near Uxbridge.

Eriophorum angustifolium Roth. 1. Uxbridge, near Denham, 1898.

Carex disticha Huds. 1. Uxbridge. 2. Drayton. — *C. muricata* L. *Spec. Pl.*, not of Herb. 5. Brentford, *L.*—*C. paniculata* L. 1. Near Uxbridge. — *C. paradoxa* Willd. Near Denham.—*C. axillaris* Good. 1. Wyatt's Lane.—*C. panicea* L. 1. Uxbridge. —*C. flacca* Schreb. 1. Moor Hill Farm, *L.* 2. Near Colnbrook. —*C. hirta* L. 1. Uxbridge. 2. Drayton. 5. Apperton, *L.*—*C. acutiformis* Ehrh. 1. Harefield, *L.*; Uxbridge. 2. Drayton,

Poyle, &c. 4. Harrow, *L.*—*C. riparia* Curt. 1. Yewsley, *L.* 2. Drayton.—†*C. vulpinoides* Michx. On embankment, Brentford, July, 1903, *L.*

†*Setaria viridis* Beauv. 1. Yewsley; Uxbridge, *L.* 2. Drayton.—†*S. verticillata* Beauv., *S. italica* Beauv., and †*S. glauca* Beauv. All at 2. Drayton.—*Panicum sanguinale* L. 2. Drayton.—†*P. Crus-galli* L. 2. Drayton.—Var. *longiaristatum.* Acton, *C. G. Green.*—†*P. miliaceum* L. 2. Drayton. ? 5. Kneller Hall, *L.*—†*P. capillare* L. Crouch End, *L.*—†*Sorghum vulgare* Pers. and †*Zea Mays* L. At 2. Drayton.—†*Phalaris canariensis* L. 1. Uxbridge. 2. Drayton. 3. Southall. 5. Acton, *L.*—†*P. aquatica* L. and †*P. minor* Retz. Both at 2. Drayton.—Earlier records for *Alopecurus geniculatus* L., *A. pratensis* L., and *Anthoxanthum odoratum* L. than those given in the *Flora* will be found in Stillingfleet's *Grasses* of 1759.—*Phragmites vulgaris* Druce. 1. Uxbridge.—*Alopecurus æqualis* Sobol. 5. Perivale, 1900, *L.*—*Milium effusum* L. 5. Perivale, *L.*—*Calamagrostis epigeios* Roth. 1. Northwood, *L.*—*Apera Spica-venti* Beauv. 1. Uxbridge. 2. Drayton.—*Agrostis canina* L. 1. Northwood, *L.*—*A. tenuis* Sibth. 5. Acton, *L.* A viviparous form at Winchmore Hill Wood, 1909, *L.*—*A. alba* L. 1. Harefield, *L.* 5. Apperton, *L.*; Ken Wood.—Var. *prorepens* Koch. 1. Drayton. First recorded as *A. sylvatica*, Stokes Bishop's Wood, *With. Nat. Arr.* p. 74, 1787.—†*A. verticillata* Vill. 7. Acton, *L.*—*Holcus lanatus* L. 2. Colnbrook. 4. Bentley Priory, *L.* 5. Acton, *L.*—*Deschampsia cæspitosa* Beauv. First recorded by *La Gasca*, 1827.—*Trisetum flavescens* Beauv. 2. Teddington, *L.*—*Avena fatua* L. 2. Near Staines, *L.*—†*A. sativa* L. and †*A. orientalis* Schreber. 2. Drayton.—*A. pubescens* Huds. 1. Harefield, 1901; Moor Hill Farm, 1908, *L.*—*Arrhenatherum tuberosum* (Gilib.). 1. Uxbridge. 2. Teddington, *L.*—*Melica uniflora* Retz. 4. Bentley Priory Woods, *L.*—*Poa annua* L. First recorded by *La Gasca* in 1827.—*P. nemoralis* L. 4. Bentley Priory Woods, *L.*—*P. pratensis* L. var. *subcærulea* (Sm.). 5. Acton, *L.* 7. Ken Wood grounds.—Var. *angustifolia* (L.). 4. Wembley Park (as *P. compressa*), *L.*—*P. compressa* L. Yewsley, *L.* 3. Southall, *L.*—*Glyceria aquatica* Wahl. 5. Apperton, *L.* First recorded, St. George's ditches, *Dillen. Herb.*—*G. plicata* Fr. 1. Uxbridge. 2. Drayton.—Var. *pedicellata* (Towns.). 1. Harefield, *L.*—*Catabrosa aquatica* Beauv. 1. Moor Hill Farm, *L.*; near Denham.—*Festuca Myurus* L. 1. Yewsley, *L.*—†*F. ligustica* Bertol. 5. Chiswick, *W. Sherrin.*—*F. rubra* L. 1. Uxbridge, &c. 2. Drayton; Colnbrook; Hampton. 5. Chiswick, *L.* 7. Ken Wood.—*F. adscendens* Retz. 5. Acton Wells, *L.*—†*Bromus arvensis* L. 1. Northwood; Uxbridge, *L.* 2. Drayton. 6. Muswell Hill, *L.*—†*B. brizæformis* Fisch. & Mey., †*B. tectorum* L., and †*B. japonicus* Thunb. 2. Drayton.—*B. interruptus* Druce. 1. Near Uxbridge, see *Journ. Bot.* 1898, p. 319. 3. Southall, *L.*, 1903.—*B. secalinus* L. 1. Denham. 2. Drayton. 5. Acton, *L.*—*B. commutatus* Schrad. 1. Uxbridge; Denham. 2. Drayton; Harmondsworth.—†*B. unioloides* H. B. K. 2. Drayton, 1901. 7. Highgate, *L.*, 1908.—*Hordeum nodosum* L.

1. Uxbridge. First recorded by *La Gasca*, 1827.— †*H. jubatum* L. 2. Drayton. 5. Acton, *L.*— *H. marinum* Huds. Alien. 1. Uxbridge, *L.*—*Lolium perenne* L. First recorded by *La Gasca*, 1827.—†*L. italicum* Braun. 1. Uxbridge, &c. 2. Drayton, &c. 5. Acton, *L.*—†*L. temulentum* L. 2. Drayton. 5. Acton, *L.*— Var. *arvense* (With.). 1. Uxbridge, *L.*

Dryopteris aristata Druce. 2. Poyle. Still at Ken Wood.

Equisetum sylvaticum L. var. *capillare* Hoffm. Harrow Weald, *L.*

ARMERIA ALPINA Willd. IN BRITAIN?

By H. Stuart Thompson, F.L.S.

In Mr. Williams's *Prodr. Fl. Brit.*, part 7 (1910), *Armeria alpina* Willd. is given and diagnosed for a plant occurring in Teesdale, the English Lake District (*fide* Baker), North Wales, the Scottish Highlands, and Kerry. In the same writer's compilation on *The High Alpine Flora of Britain* (1908) he mentions three specimens in Herb. Brit. Mus. from Ben Lawers, Snowdon, and Carn Tual, named *A. pubescens* var. *planifolia* Nyman, as "severally agreeing with Spanish specimens of *Armeria alpina* Willd." He goes on to say that unless more definite evidence is forthcoming he should be very much disposed to consider these high alpine examples as true *Armeria alpina* Willd.

On telling Mr. Williams I should like to see a British or Irish specimen of *A. alpina* Willd. (*Statice montana* Miller)—the only mountain forms of Sea-Thrift which I had seen from these Islands were quite different from *A. alpina* as it grows in the Alps—he replied that he "was unable to see any real *specific* differences between the British and Continental specimens of *Armeria alpina*."

I think no one who had ever seen the handsome deep rose heads of *A. alpina*, growing on stalks eight or nine inches high at 9000 ft. above the sea, would place them with the small pale-coloured variety of *A. maritima*, which is abundant on some of our own mountains. In the Alps *A. alpina* is rarely seen as low as 2000 metres, to which level it descends on La Tournette, in Savoy. But 7000 to 9000 ft. is its usual range in the Western Alps. On the Col de la Leisse, in Savoie, I found it at 9120 ft., or 2780 m., and on the Aiguille du Goléon, in Dauphiné, at 9800 ft., or 2857 m.—not below in either case. It is noticeable that Prof. Lino Vaccari (*Flora Cacuminale della Valle d'Aosta*, 1901, p. 23) records *A. alpina* from six localities between 2800 and 3150 m., but from only two between 2600 and 2800 m. in the mountains of the Aosta district.

It is always very local, and in Switzerland rather rare, occurring in five cantons only. These facts of altitude alone are of some importance, for nearly all the Alpine plants found in Great Britain and Ireland, except *Saussurea*, are seen at much lower

elevations on the Continent than *A. alpina* ever is, as far as my knowledge goes. I am not aware of a single British Alpine plant whose average range in the Western Alps, or still less in Switzerland, is as high as 8000 ft.

Again, *A. alpina* prefers a calcareous soil, such, for example, as the striking isolated mass of carboniferous limestone forming the Tournette, overlooking the beautiful Lake of Annecy. In Vaccari's *La Flore de la serpentine, du calcaire et du gneiss dans les Alpes Graies Orientales* (1903), p. 19, we find *A. alpina* among the species called "calciphiles, c'est à dire prédominantes dans le calcaire," and, though found also in the serpentine zone in small quantity, that careful Italian observer says it is only in parts of that zone where the lime has not been completely denuded. I believe very few of the mountains in the British Isles which produce Sea-Thrift are of limestone formation (such as Widdy Bank Fell). Certainly, on Carrantual, in Kerry, the plant is not *A. alpina*; it is found there on the Devonian slates, and its short tufted masses of pale blossoms ascend to the summit (3414 ft.). Mr. Lloyd Praeger bears me out in placing the Irish mountain plant under *maritima*.

In *A. alpina* the sheath appears to be distinctly longer than in *A. maritima* and its mountain variety, the flowering head is larger, more handsome, and a deeper colour, the calyx-tube slightly longer, the leaves obscurely three-nerved, and the whole plant more robust. Whereas *A. maritima* has obviously one-nerved leaves, Mr. Williams appears to have ignored the fact that those of *A. alpina* are indistinctly three-nerved, or ordinarily three-nerved, according to Koch, Boissier, Kerner, Dalla Torre, and Keller and Schinz. Among the authorities I have consulted, Coste alone describes the leaves as with one nerve. In regard to Boissier's grouping of forms on the character of the pubescence being limited to the ribs or being spread over the whole of the calyx-tube we need not enter here, for Messrs. Williams and H. & J. Groves consider it unsatisfactory. It is, however, a point of distinction kept up by Keller and Schinz.

At present, in the country, I am not in a position to distinguish more critically what I firmly believe to be two species, nor have I seen recently Mr. Druce's paper on Sea-Thrift in *Journ. Linn. Soc.* xxxv. 66; but I submit the above facts for what they are worth, after studying Mr. Williams's interesting notes and suggestions.

Those whom it may interest will find an allusion by Dr. Briquet (on p. 143 of *Le Développement des Flores dans les Alpes Occidentales*, extracted from the "Scientific Results" of the Botanical Congress at Vienna, 1905—a most interesting and able paper on the origin of the Alpine flora) to *Armeria alpina* associated with *Empetrum nigrum*, *Polemonium humile*, *Arctostaphylos alpina*, and *Dryas octopetala* in forming a typical Arctic tundra in North-east Russia.

NOTE ON *FISSIDENS TEQUENDAMENSIS* Mitt.

By H. N. Dixon, M.A., F.L.S.

I recently had occasion to consult Mrs. Britton upon the relationship of the Irish *Fissidens* described (*ante*, p. 147) as *F. exsul*, sp. nov., with *F. tequendamensis* Mitt.; and in the course of correspondence mentioned that I had not had an opportunity of examining the peristome of the South American plant. This led to Mrs. Britton studying *F. tequendamensis* with somewhat interesting results. The peristome of *F. tequendamensis* revealed precisely the same structure as that described (*loc. cit.*) for *F. exsul* and *F. algarvicus*, having the same cristate internal lamellæ. This is probably a more or less general feature among certain types of *Fissidens*, since it occurs in various groups, and in plants of widely differing distribution. It is, for instance, exhibited in a probably undescribed species of the section *Amblyothallia*, recently collected near Newcastle, New South Wales, as pointed out to me by Mr. W. H. Burrell, who received it from the collector, Mr. Chas. J. Burgess.

Mrs. Britton's investigation led, moreover, to a further conclusion, *viz.* that *F. tequendamensis* Mitt. is identical with *F. Lindigii* (Hampe), and must give place to that name. I quote from her letter :—"I have spent the day studying *F. tequendamensis* and *F. Lindigii* Hpe.! I think they are the same species, from the same type locality, the Falls of Tequendama ; slightly variable in the number and size of the leaves, and therefore in the size of the cells, also in the length of the seta, but well characterized by the fimbriate, cristate lamellæ at the base of the teeth, the projecting dorsal joints, and the walls of the capsule which have parenchyma cells at base with stomata, and collenchyma cells above which contract when dry, making the mouth of the capsule flaring, with 3–4 rows of hexagonal cells on the rim; the spores are 10–13 μ usually, and the lid also has two kinds of cells. I find the male in small rooting basal buds or occasionally terminal. (See Mitten, Musc. Austr.-Amer. p. 601, 'dioicus?') The type of *F. Lindigii* must be at the British Museum, and probably they can spare a specimen, as it was distributed in Lindig's mosses, No. 2149."

I thereupon made a careful examination of Lindig's plants in Hampe's herbarium in the British Museum, and found that they entirely corroborated Mrs. Britton's conclusion. There is a fair amount of material of *F. Lindigii*, comprising several gatherings from the same locality, which show a slight range of habit and size, but agree in essential characters with one another and with the specimen which may be taken as Hampe's type, and from which he drew up his description. The areolation I found to be generally a little smaller and less elongate than in Mitten's *F. tequendamensis* (Weir, No. 319), but not very markedly and not constantly, certainly not sufficiently so to constitute a specific or even a varietal difference.

It is rather strange that Mitten should have overlooked the

identity of Weir's plant with Lindig's, seeing that both come from the same locality. It will be seen on comparing his descriptions of the two that neither in the text nor in the key are any characters given that indicate a real distinction between them. It would seem probable that Mitten, having failed to find male flowers on Weir's plant, concluded that it was probably dioicous, and therefore not to be identified with Hampe's species.

The synonymy must stand as follows:—

Fissidens Lindigii (Hampe) Jaeg. Enum. Fissid. p. 12 (1869).
Conomitrium Lindigii Hampe in Linn. 1862, p. 532.
F. Eckloni Schp. MS. in herb. (*fide* Salmon in Ann. of Bot. xiii. 126).
F. tequendamensis Mitt. M. Austr.-Amer. p. 601 (1869).
Schistophyllum Orrii Lindb. in Rev. Bry. 1880, p. 97.
F. Orrii Braithw. Brit. Moss. Fl. i. 73 (1881).

SPIRÆA ULMARIA L. var. *DENUDATA* Boenn.

By G. Claridge Druce.

From time to time the value of this variety has been called in question; see Journ. Bot. 1904, p. 308, where Mr. Horwood quoting Mr. Riddelsdell (Bot. Exch. Club, 1900, p. 626) says it "seems to me to be a weakened state of the type with which it usually grows. The quantity of bloom is usually smaller than with the type, and is frequently diseased, and the fruit does not ripen freely. The contrast between type specimens and the weak unhealthy *denudata* form is very striking." Mr. Horwood goes on to say, "like many others, I had always thought the variety worthless . . . At Scraptoft, Leicestershire, I found typical *S. Ulmaria* possessing leaves characteristic of the so-called variety *denudata*, and also a leaf intermediate in character, with a whitish margin only; the central portion of the under surface being of a uniform green colour, the supposed variety can thus only be considered at best as a condition. The exclusion of this variety from the British flora is perhaps only one amongst many similar erasures that might be made, if students would only take the trouble to record their observations." One fact is brought out by Mr. Horwood, that the presence of a leaf character of *denudata* did not produce the unhealthy state described by Mr. Riddelsdell, but I think that both observers were speaking from insufficient experience.

Some botanists, especially those who have pursued their work more in the herbarium than the field, appear to think that a variety or a species may be as sharply defined by characters as a mineral or a gem. This is not quite the case. How many species of Roses, Brambles, Hawkweeds, &c., would bear the test of constancy of characters, and if this be true of species, how much more of varieties? We must be careful not to dogmatize on insufficient evidence. I hold no brief for *denudata*.

I did not introduce it to the British list. It was founded as a species by Presl and reduced to a variety by Boenninghausen, botanists of high reputation; it is admitted into the chief continental floras, and I have included it in my *List* and the *Pocket-Book*. At present I have seen no evidence of a scientific nature to show reason why it should be erased, remembering, what has, perhaps, been overlooked, the remark of Mr. Beeby, who was extremely cautious in giving varietal rank to mere forms (Bot. Exch. Rep. p. 170, 1887):—"Although but a slight variety and usually found growing with the type, yet the same clump grown at Reigate first in wet peat, and afterwards in the sandy soil of the district, has maintained its character for several years." Major Wolley-Dod (*l. c.* 1892, p. 361) says "it appears quite independent of sunshine or shade." In our area the plant is rare; in certain districts of Britain I have seen it in considerable plenty and quite healthy, unmixed with the type; in other instances, growing with it (see Journ. Bot. 1905, p. 17). When they grow together I should not be surprised to find intermediates, as doubtless they hybridize, as do the white and purple-flowered forms of *Origanum vulgare*. Cultural experiments are really needed to settle this question, in order to see if the seeds of *denudata*, from a habitat in which that form only grows, when grown in a different soil maintain the character of the parent or revert to the ordinary form. Careful cultural experiments may eliminate certain varieties, but I am disposed to believe that the aggregate number will not be reduced, since it will give many other forms higher status than they now possess. Professor Trow's recent interesting and valuable experiments show how truly apparently trivial characters are perpetuated. From seeing the tiny woolly *Senecio vulgaris* in Guernsey, I was convinced it was a variety; this, I think, Prof. Trow has shown to be the case by his cultural experiments; in their absence one would have scarcely felt justified in giving it that grade. I have endeavoured to steer clear of the difficulty in deciding what is a variety or a species—the standard varies enormously. Bentham lumped species remorselessly, sometimes with ludicrous results: fancy suggesting *Carex depauperata* to be a starved form of *binervis*! But the same botanist established the var. *parviflora* of the Ground Ivy, and described the var. *pubescens* of *Scutellaria galericulata*; compared with these *Spiræa Ulmaria* var. *denudata* may hold its own. Many varieties (and even some species) of Sedges which previous authors had established are reduced by Kükenthal, in his valuable and erudite work in the *Pflanzenreich*, to forms; it is not unlikely in the future some of his own varieties will share the same fate, and that some of the others may be once again restored. In the treatment of the *Papaveraceæ* in the same work, Fedde has designated as varieties the colour forms of *P. Rhœas*, e.g. var. *leucanthum*, var. *violaceum*, var. *pallidum*; while *strigosum*, whose claim to varietal rank has been also challenged in these columns, is made a distinct species separated by nineteen others from *Rhœas*. Since there is this great variation in standard, any List or Flora must contain species and varieties

of very different values. In the study of segregates lies the true secret of evolution, and it is amazing that, after the experience of the last fifty years, some still appear to think that a variety or a species is an unvarying unit.

[Mr. Druce's note has especial allusion, we believe, to a remark made on p. 62 in the course of a review of his edition of the *Botanists' Pocket-Book*, and, whatever may be the merits of the plant of which he now writes, we are still of opinion that the term variety is often used when "form" or "state" would be more correctly employed, and that names are often bestowed upon plants which have no claim to be regarded as distinct. We have not ourselves met with the kind of botanist to whom Mr. Druce refers, but it is certain that the knowledge of a great herbarium tends to enlarge one's views of species, and that many plants which appear distinct when only a limited amount of material is available are found to be conspecific when a greater number of specimens comes under investigation. Mr. Druce says: "How many species of Roses, Brambles, Hawkweeds, &c., would bear the test of constancy of character?" and proceeds, "if this be true of species, how much more of varieties!" But this is to beg the question: Mr. Druce must know as well as we do that in these fluid genera there is great diversity of opinion as to the rank of the plants to which the term "species" is applied. We should like to take this opportunity of repeating the view which we have more than once expressed as to the desirability of a careful inquiry into the varietal names which appear in such abundance in our lists and reports. Such inquiry should ascertain in how many cases type-specimens have been seen for comparison: in how many a verbal description has been relied upon; and, in the latter case, whether such description is adequate or so brief as to be of but little value. As Mr. Druce suggests, cultural experiments, such as the very interesting ones of Prof. Trow, are greatly to be desired. We have a strong conviction that if investigations of the kinds indicated were carefully carried out, the number of varieties which appear in our lists would be very considerably reduced.—Ed. Journ. Bot.]

SHORT NOTES.

Hyoscyamus niger var. pallidus.—In July of last year, Mr. E. H. Wilding sent me from Wexham Place, Stoke Poges, Bucks, specimens of this rare variety of the common Henbane, which differs from the type form in the corolla, which lacks the characteristic purple veins. He raised these plants from seeds saved from a single specimen which appeared on a heap of waste earth thrown up from the excavation of Culross Abbey, Scotland. It was not accompanied by other weeds, so it is reasonable to suppose that the seed may have lain dormant at a considerable depth for many years. Seeds ripened last autumn at Stoke Poges

were sown at Kew on July 1st. Only one plant germinated, but this shot up and flowered in a few weeks, proving it to be annual and also showing that it comes true from seed. This variety is not included in any of the recently issued British plant lists, presumably on the grounds that it is a mere colour variety. It has, however, been described as a species by Waldstein and Kitaibel ex Willd. Enum. Hort. Berol. i. p. 227 (1809) as follows:—"*Hyoscyamus pallidus*. H. foliis amplexicaulibus angulatis, radicalibus angulato-dentatis, floribus sessilibus, corollis unicoloribus. Habitat in Hungaria. Simillimus *H. nigro* sed radix annua et flores flavi, absque venis violaceis reticulatis." There are specimens in Herb. Kew from the following localities:—"Bury Hill," 1828 (Herb. Forbes Young). "Rubbish heap at Kew, July 1877, J.G.Baker." "Esher, Surrey, August, 1843, scarcely wild, roadside near gardens, H. C. Watson." Smith (Eng. Flora i. p. 316) records this variety from Fincham, Norfolk, where it was found by the Rev. R. Forby, together with an intermediate form very faintly veined. Syme also gathered it at Portobello in Midlothian (Eng. Bot. ed. 3, vi. 106). There are also specimens at Kew and the British Museum from continental localities.—A. Bruce Jackson.

Tragopogon Hybrid (p. 203).—Mr. A. Wallis asks me to put on record that he noted this hybrid in 1903 in an old clay-pit on the outskirts of Cambridge when botanizing with Mr. A. Welsh. The peculiar colour of the flower, recalling that of *Medicago sylvestris*, which is apparently a hybrid of the yellow *falcata* and purple *sativa*, attracted attention. The outer florets were a very light reddish brown, here and there tinged with purple and veined with very distinct green lines (as in *porrifolium*), the florets passing into green below and so to yellow at their base. The inner florets were a dirty olive-green, also yellow at their base. The peduncles were less thickened than those of normal *porrifolium*, and were more of the *pratense* type; the pappus was slightly tinged with reddish purple at the top, but not so strongly as in *porrifolium*, and no perfect seeds could be found.—C. E. Salmon.

Peloria State in Foxglove (p. 234).—One would like to know whether this peculiar growth has been noticed in other parts of England this summer. Here, in North Somerset, a number of the foxglove plants (both white and red) in my own and in a neighbour's garden have been similarly affected. What I presume is a hybrid between *Digitalis lutea* (from Switzerland) and *D. purpurea* made its appearance five years ago on my rockery, and has flourished and flowered profusely ever since, but I have not noticed any seedlings from the plant. The flowers are larger than those of *D. lutea*, and of a decided pink colour. Is this a common hybrid?—W. F. Miller.

S. Kerry Plants (p. 227).—In my "Notes on South Kerry Plants," I said that *Thymus* and *Sieglingia* are entirely absent

from Mr. Williams's list of one thousand metre plants. I regret to find that I stupidly overlooked the fact recorded by Mr. Williams in *Ann. Scott. Nat. Hist.*, 1908, p. 248, that *Thymus Serpyllum* "ascends to 1130 m. on rocks in the Breadalbane district (Fl. Perthsh. 239)." Dr. Scully informs me that the finding of *Juncus trifidus* on Carrantual is the first modern record for Ireland.—H. S. Thompson.

Mentha alopecuroides Hull.—With reference to the interesting note on this plant at p. 249 of the *Watson Exchange Club Report for 1909–10*, it may be worth putting on record that I gathered this mint in August, 1897, on Norton Heath, near Ongar, not far from the station for *Bupleurum falcatum*. I should hesitate to say it was native there, and suspect that, like some of our other uncommon mints, it was a relic of former cultivation.—H. W. Pugsley.

Hieracium carenorum (p. 188) in East Ross.—I learn from the Rev. E. S. Marshall that the station in which he gathered it is quite distinct fron the one in which the Rev. H. J. Riddelsdell found it. This is interesting as extending the range of a local plant.—G. C. Druce.

REVIEWS.

Report of the Botanical Exchange Club for 1909. By the Editor and Distributor, S. H. Bickham, Esq., F.L.S., Underdown, Ledbury. 8vo, wrapper, pp. 411–488. Oxford: James Parker & Son. 1910. Price 2*s.* 6*d.*

The comments we made upon the previous report apply in great measure to this, and as they were published so recently (see p. 114) it is not necessary to repeat them. As usual, there is a curious want of literary arrangement which tends to confusion: thus the Report of the Editor, which alone appears in the title on the wrapper, is preceded by "The Report of the Treasurer and Secretary," Mr. Druce: it is not easy to see how what amounts to a survey of what has been done in British botany without any reference to the Club can rightly be included in "the Report" of its Secretary. Moreover, this is now extended to include notices of "recent publications" and other matters; on this principle it would be possible to include almost anything in what is called a "Report." We cannot but regret that information as to plants not elsewhere recorded should be given in the Report; this is to alter its character altogether, and is likely to lead to such records being overlooked, for there are many botanists, besides foreigners, who are not members of the Exchange Club and whom the Report does not reach.

To go a little into detail. Although it is natural that when Mr. Druce speaks of "the 'List,'" he should mean his own compilation, it would be well that this should be made clear, at any rate when it

is first mentioned, as the British Museum *List of Seed-Plants* has equal claim to be so designated. Similarly the numbers quoted refer to Mr. Druce's publication, although, considering the connection between the Exchange Club and the *London Catalogue*, it might be supposed that the latter would be thus indicated. Some of the notes convey—at any rate to us—no information—*e. g.* "368. *Cerastium alpinum* × *vulgatum* = *C. alpinum* L. var. *pubescens* Syme": "370. *C. vulgatum* × *nigrescens* (*arcticum*) = *C. Blyttii* Baenitz." Considering the relations between *Sagina apetala* and *S. Reuteri*, we may well concur with Mr. Druce that "the recorded hybrid between such close allies requires very careful investigation." "*Stellaria palustris* Retz. var. *viridis* Fr." is the plant which formed the subject of Mr. Williams's paper in our September number; the entry in Mr. Druce's notes suggests that he includes in the Report extracts from his private correspondence, as no published reference is given for it; this seems hardly fair to observers, who may not unnaturally wish to record their own discoveries, especially in view of the exaggerated importance attached to "first records" by some of our collectors. Here, as elsewhere, we notice a preponderance of casuals, and also a sprinkling of new combinations in nomenclature; these we purposely ignore, being convinced that such casual mention of new names in a report of a local body is contrary to the spirit if not to the letter of the Laws which regulate publication.

Turning now to the Report of the Distributor, Mr. Spencer H. Bickham, we find as usual much interesting matter in connection with plants representing critical genera, as well as with regard to other species, from which as usual we give a few extracts. We must, however, once more express an opinion that some of the notes are superfluous: *e. g.* the following:—

"*Cerastium tetrandrum* Curtis. Bromsberrow Heath, v.-c. 34, June 28, 1909.—H. J. Riddelsdell. All the bracts in *C. tetrandrum* should be herbaceous, these are not.—S. H. Bickham. Surely *C. semidecandrum* L. Flowers much smaller than in *C. tetrandrum*; capsules slightly curved; sepals broadly membranous at their margins and tips; bracts with their upper half membranous, instead of being wholly herbaceous.—E. S. Marshall. A rather large plant of *C. semidecandrum* L.—H. W. Pugsley. The specimens sent me are *C. semidecandrum*; the viscid-glandular form.—J. W. White. Certainly *C. semidecandrum*; note bracts.—G. C. Druce."

It will be noted that the paragraph begins with the incorrect name of the plant, and that it has been thought necessary to quote the concurrent verdict of six botanists in correction of the misnomer! This however is at any rate less confusing than when authorities differ, as with regard to the specimens sent as *Sagina Reuteri* var. *glabra* sent by Mr. W. G. Travis, which Mr. C. E. Salmon "thinks correctly named"; Mr. Marshall considers *Reuteri*; Messrs. Bucknall & White call "type"; Mr. Druce thinks "weak" and Mr. Bickham "unhealthy" *apetala*. Surely, again, it was unnecessary to print the notes by the Rev. A. Ley which run: "I

believe this to be what Hedlund calls *Sorbus Aria sensu stricto*.—A. Ley. Hedlund must not be quoted as pronouncing this to be *S. Aria sensu stricto*. He now (Dec. 1909) writes that he has never seen *S. Aria sensu stricto* from Britain.—A. Ley." Nine lines later we read, of another form of *S. Aria*:—"I believe this to be equivalent with plants sent to Prof. Hedlund in 1908, and pronounced by him to be '*Sorbus Aria sensu stricto*.'—Augustin Ley."

The following are selected from the more interesting notes:—

"*Cerastium arvense* L. var. *Andrewsii* Syme. Limestone slopes of Cappanawalla, Co. Clare, June, 1909. Differs from the ordinary Midland plant by being greener, rigid and brittle, and the leaves being more recurved. It resembles specimens sent by H. C. Levinge in 1892 and 1894 from the same locality, passed as above by the Club, but as Syme himself says, 'it is connected with the typical form by all intermedial stages.'—G. C. Druce. 'It is much more glabrous than the usual forms, and though the calyx and stem are both slightly hairy, yet the hairs are very short, and on the latter reflexed,' Eng. Bot. ii. p. 89. How can this apply to these specimens? The peduncles, stems, and calices are as hairy as the normal form—the leaves certainly are less so than usual, and do answer fairly well—but, strange to say, Linnæus, Sp. Pl. ed. i. 1, 428, 1753, says, 'foliis lineari-lanceolatis obtusis *glabris*.' I do not think Dr. Boswell would have put his name to this. Dr. Boswell says this plant has been named *C. strictum* L., but agrees better with his *C. suffruticosum* L. I think these specimens do come near a North American form, *C. arvense* var. *oblongifolium*, n. var. (Bull. Torrey Bot. Club, xiv. 1887, p. 74, t. 68), Hollich and Britton. Of the smaller forms described under that as f. *Serpentina*, these specimens seem to accord fairly well. The authors reduce Dr. Torrey's *C. oblongifolium*, Fl. U. S. i. 460 = Fl. New York, i. 99, to the above variety. Then again these specimens are mostly 3–5-flowered. Syme's plant usually 1-flowered, rarely 2-flowered.—A. Bennett. It seems likely that Mr. Druce collected both the type and var. *Andrewsii*; the specimen forwarded to me for inspection has decidedly *hairy* leaves, and is, therefore, only the former, with somewhat rigid foliage, doubtless due to exposure on limestone.—E. S. Marshall. My specimens are abundantly pubescent and several-flowered (excepting one small piece), so I should say it is nothing more than the type.—H. W. Pugsley.

"*Vicia sylvatica* L. var. *condensata* Druce in *Naturalist*, 1884, pp. 85, 86, and *Rep. of Bot. Exch. Club*, 1883, p. 85. Originally found on the shingly shore of Port William, Wigton, v.-c. 74. This year I saw it in great quantities on the shingle about two miles north of Drummore, in the same county, and nearly opposite the original station. It grew in compact masses a foot or two across; the leaves were firm in texture, often glaucous and smaller than the type, the flowers were in subcapitate racemes of larger and darker coloured flowers. I am trying to grow it to see if the characters persist. August, 1909. It occurred also on the Kirk-

cudbrightshire coast.—G. C. Druce. Cultivation should prove whether this is a true variety. At present I incline to consider it only a starved *state*; a very similar form occurs on the exposed coast near Minehead, S. Somerset, whereas in more sheltered places it is quite normal.—E. S. Marshall.

"*Pyrus Aria* Ehrh. var. *rupicola* Syme? Great Doward, Herefordshire, July 26, 1909. Mountain rocks, Taren-r-Esgob, Monmouthshire portion, July 1, 1909. In a long and interesting note on these plants, Prof. Hedlund pronounces them to differ widely from *Sorbus Aria* in conformation of the pollen, and to stand much nearer to *Sorbus obtusifolia* and *S. salicifolia*. He believes that Syme placed them along with *S. salicifolia* in his var. *rupicola* of *Pyrus Aria*, and accepts, provisionally, Syme's name of *rupicola* for them. *S. salicifolia* has longer, narrower, cuneate-based leaves, and may be known from the plant in question by the much darker colour of the sepal underneath the loose floccum. I have been used to join these two plants together as falling under Syme's var. *rupicola*, and I believe Syme has so named specimens of the plant in question for me; but he certainly included in his variety the plant named *Sorbus salicifolia* by Hedlund. The difference in the colour of the sepal works out true in my herbarium.—Augustin Ley. Later (January, 1910), Hedlund writes that further investigation has satisfied him that Syme's *P. Aria* var. *rupicola* is identical with *S. salicifolia* Hedlund, and cannot be taken to include the present plant.—A. Ley.

"*Pyrus intermedia* Ehrh. Cheddar, Somerset, v.-c. 6, June 28, 1909. The plant we have been calling *intermedia* Ehrh. in Britain is about to be described by Prof. Hedlund under another name, as a subspecies very close to *Sorbus Mougeoti* Soy. et Godr. It will be better to await his description before saying more about it. These specimens have greyer felt than is usual with *P. intermedia*.—Augustin Ley.

"*Pyrus scandica* Asch. Near Garve, E. Ross, v.-c. 106, July 10, 1909 [ref. No. 3372A]; and also sent by W. A. Shoolbred [ref. No. 692]. Named by Dr. T. Hedlund (through Rev. A. Ley) as *Sorbus scandica*. Mr. Shoolbred and I found six trees in all, one of them (my 3372A) evidently of great age, and fruiting abundantly. So far as we can judge, the plant is native there; it grows in uncultivated ground, and we did not see it in gardens. It very closely resembles Mr. N. E. Brown's figure of *P. intermedia* Ehrh. in E. B. ed. 3, Supplement. Syme's illustration of *P. scandica* represents quite a different plant, probably *P. decipiens* Bechst. I believe that the Arran *P. scandica* Bab. is *Sorbus arranensis* Hedlund, to which Mr. Ley, at first sight, inclined to refer our gatherings. Whether *P. intermedia* Ehrh. (the oldest name) is really the same as *P. scandica* Asch. I do not know. Anthers brownish pink.—E. S. Marshall.

"*Melampyrum pratense* L. var. *purpureum* C. J. Hartm.? Damp, sandy, turfy ground over granite below the crags at the head of Glen Eunach, at 2400 ft. Also slope of Geal-charn, Glen

Feshie, at 2200 ft., v.-c. 96, Easterness, July, 1909. The dried specimens unfortunately give but a very imperfect impression of the fresh plant. This has a peculiarly neat, erect, and compact, rigid habit, and the flowers which are tipped with a rich purple or magenta give it a striking and beautiful appearance. These characters are, however, less marked in the plant from Glen Feshie, which may perhaps be accounted for by the locality there being less alpine and the aspect less bleak.—J. A. WHELDON and A. WILSON. This is described as follows in Hartman's *Skandinaviens Flora*, ed. 11, p. 121, 1879:—'Corollas dark red; the lower lip yellow within.' The present plant still shows traces of a deep crimson colouring; so it is probably correct. I have often seen var. *montanum* (Johnst.), to which—as a colour-form—it clearly belongs, with the flowers beautifully rose-tinged, but never quite like this.—E. S. MARSHALL.

"*Betula alba* (*verrucosa*) × *tomentosa* [ref. No. 3381]. Garve, E. Ross, v.-c. 106, July 20, 1909. This, from its characters, I believe to be a hybrid between the 'weeping' form of *B. alba* (*B. pendula* Roth.) and *B. tomentosa* (*pubescens* Ehrh.). Branches drooping; intermediate in foliage and catkins. Lateral lobes of female catkin-scales mostly spreading, sometimes rather recurved. It occurred in two different forms.—E. S. MARSHALL. Also sent by W. A. Shoolbred [ref. Nos. 686A and 688A]. We cannot satisfy ourselves that this is a hybrid. The leaves are entirely those of *verrucosa*, with just a few scattered hairs on their margins. And the fruit is not broadly oboval. The catkin-scales are perhaps intermediate in shape between those of the two species; but we have reason to think that little reliance should be placed on this distinctive feature. In Koch's descriptions (ed. iii.) no prominent place is given to the catkin-scales.—C. BUCKNALL and J. W. WHITE.

"*Salix Doniana* Sm. = *S. purpurea* × *repens*? By the Cherwell, the Parks, Oxford, September, 1909. Formerly grown in the Salicetum at the Botanic Gardens, then removed to this locality. The labels of these willows are now mostly lost or misplaced. I thought members might like to have this rare plant, which was shown me by the late Mr. W. H. Baxter as being the one sent by Borrer to his father, Mr. W. Baxter, the author of *Phænogamous Botany*.—G. C. DRUCE. A leaf specimen only. If this were the plant received by Mr. Borrer, through Geo. Anderson, from G. Don, and supplied by the former to Sir J. E. Smith for description, good specimens would no doubt be welcome. The descriptions of that plant are very precise from Sm. Engl. Fl. iv. 213, to Syme, E. B. (3rd ed.) viii. 219; garden specimens are preserved in Hb. Borrer at Kew; and also widely distributed through well-known sets, for there can, I think, be no doubt that Leefe's Sal. Exs. iv. 99, and our *Set of British Willows*, No. 6, are actual descendants of Borrer's plant. I have garden specimens by me from four different gardens, and can make allowance for such variation as can be caused by wet and dry ground, exposure and shade: but it is impossible to identify the Oxford plant with

S. Doniana Sm., nor do I think there is any *S. repens* in it, but only *S. purpurea* L., of which the flowers would probably show that it is a fairly typical form. Botanical gardens want their labels overhauling every ten years by experts in the critical genera: I could give some curious instances in proof.—E. F. Linton.

"*Lilium Martagon* L. Wood at Broken Dike, Tidenham Chase, W. Glos., v.-c. 34, July 5, 1909. I agree with Mr. Shoolbred as to the high probability of the species being native in this and other localities in the neighbourhood.—H. J. Riddelsdell."

Bref och skrifvelser af och till Carl von Linné ; med understöd af Svenska Staten utgifna af Upsala Universitet. Första Afdelningen. Del iv. Bref till och fran Abraham Bäck, 1741–55. *Utgifna och med upplysande noter försedda af* Th. M. Fries. Stockholm (Aktiebolaget Ljus), 1910. 8vo, pp. iv. 365.

This volume is a continuation of the important series forming a national monument to one of Sweden's most distinguished sons, which has been noticed in this Journal (May, 1909, pp. 190, 191 ; Feb., 1910, pp. 63, 64). On the last occasion, when noticing the third volume, it was pointed out that the Swedish letters published embraced those under A and B, with the exception of Bäck, which would, it was then thought, well-nigh fill the next volume.

The volume now before us only includes about half of the letters which passed between Bäck and Linné. For many years Bäck's house at Stockholm was Linné's resting-place whenever the Professor travelled from the university town to the metropolis, but it was precisely because the two friends were too far removed to be able to converse frequently, and not so far as to impose any reserve in their exchange and letters, that this interesting series of letters arose.

Prof. Fries's introduction gives so good an account of this correspondence that the best and simplest way will be to extract from his preface the following paragraphs :—

"Amongst the many persons with whom Linné corresponded, Abraham Bäck takes a commanding place. Their first intercourse may have taken place at the beginning of 1730, when both of them were living in Upsala as medical students. Closer relations, however, probably did not occur until 1740 or 1741, during the period when intrigues were proceeding at Upsala to prevent Linné being instituted as Professor, in order that J. G. Wallerius might obtain the vacant post, after the younger Oluf Rudbeck. The newly created Doctor of Medicine, Bäck, was also a candidate, but, although he was Linné's competitor, that was far from causing any ill-will ; on the contrary, year after year the friendship became closer, and was only ended by death.

"A striking testimony to this is the frequent and confidential correspondence which passed between them almost the whole period from 1741 down to 1776. Evidently no small number of the letters which were written by Linné to Bäck have been lost, but notwithstanding that there are still 524 known to exist.

It is quite otherwise as regards those written by Bäck, only fifteen of which are now extant. The explanation of this may be that when the Academy of Science, after Linné's death, commissioned his oldest and most trusted friend to deliver a memorial address, he received, as appears from correspondence with the younger Linné, the loan of the father's entire correspondence, and probably also received permission to retain his own letters, of which only a few of old date were accidentally left. A similar occurrence also took place in the case of the Secretaries of the Royal Academy of Science, namely, P. Elvius and P. W. Wangentin, as already related in the preface to the second volume.

"It is readily to be understood that Linné, in consequence of his downright and marvellously intense, almost feverish, activity in many different departments—scientific authorship, lectures and other instruction, extensive correspondence with persons throughout the civilized world, time-absorbing participation in university matters, &c.—did not consider himself obliged to sacrifice much time or trouble in the authorship of letters to his most confidential friend. Correspondence with him evidently constituted a very necessary relaxation, but it also happened that these letters might be written in leisure hours in the greatest haste, *currente calamo*, without in the least degree having regard to style. They may, therefore, in a great measure be compared to a kind of hasty entries in a journal, in which is reported items for scientific work at different times, and the various other matters which for the moment caused joy or disquiet or demanded thought and care. In reading these letters, one sees Linné wholly in his everyday dress, in full and hurried activity; in writing these letters manifestly it was far from him to seek to employ well-known phrases, in which 'words are to conceal thoughts.'

"The letters to Bäck must meanwhile not be regarded as being for Linné the only and cherished means of diversion. By study of them we can easily find evidence of the warm interest with which he espoused many questions which concerned the progress of natural history and medicine in our country. Many important questions of this kind have certainly in no small measure found their solution through these modest letters, and many busy naturalists had them to thank for the realization of their plans and the accomplishment of their hopes.

"The correspondence was most animated during 1751–55. During this period both correspondents began to realize a wish to unite profit with pleasure; the letters should not exclusively consist of confidential talk about all sorts of subjects, but might also attain increased facility in the Latin language. During other years only a small number of Latin letters were exchanged; the total of such known is no fewer than 131.

"With few exceptions the letters written by Linné to Bäck are in the possession of the Royal Academy of Science, where they came, partly by purchase of the so-called Swartzian collection, partly by gift of Bäck's grandson, Exc. El. Ihre.

"The fifteen known letters from Bäck to Linné are all in the

possession of the Linnean Society; on the other hand, the Royal Academy of Science has in its possession no fewer than fifty-one letters from Bäck to the younger Linné, written during the father's last years of illness and after his death, and others are preserved elsewhere."

Archiater Abraham Bäck was born at Gefle in 1713, was student at Upsala in 1730, took his degree of M.D. in 1740, became Assessor in the Medical College in 1745, acting Court Physician in 1748, and was appointed the following year Physician in Ordinary to the King; Arkiater, and President of the Medical College in 1752, and died in 1795. He was thrice President of the Royal College of Science, Stockholm.

The collection opens with a letter dated May 6th, 1741, asking for news about the Upsala election; Linné's reply informed him that he had been elected Professor the day before the letter was written. Bäck's next letter was from Leyden in the following February, and in the September next following his third letter is dated London, Sept. 30th, 1742. From it we learn that he had written after his arrival amongst us six weeks before; he had spent a week with Dillenius at Oxford, who sent his good wishes to Linné, and lamented he could not have his help. Dillenius seemed out of health, and expressed himself tired and weary of Oxford. Later he had spent a month at Chelsea, both to take advantage of Ehret's skill as draughtsman and to have opportunity of access to the Chelsea Garden and Sloane's Museum. Miller had been very friendly, and had permitted him to take what specimens he wished. Collinson and Catesby are mentioned, and Bäck is lodging in the same house as Lawson, Linné's old friend at Leyden. Prof. John Martyn also had been visited. "It was amusing to hear Dillenius say, after many preambles and equivocations, that Linné's method was the best to make use of to find out the names of dried specimens. He answered nothing when I said that the method was equally the best to determine living plants." This interesting letter is followed by others from Paris and Berlin, containing news from that city about his old acquaintance.

From the intimacy of this correspondence we glean many interesting little items. Thus, as regards the gradual building up of the *Species Plantarum*, we find Linné, in October of 1749, saying that he was beginning to work up the *Species Plantarum* out of his ideas; he had not had time since the previous year to do much, but he had reached *Polyandria.* (This preliminary sketch is possessed by the Linnean Society.) June 28th, 1751, he reports that he is busy on the book, and has reached *Poa* in a week's work. In another letter, dated March 1st, 1752, written by an amanuensis, Linné has added in his own hand: "I am working at Species, and am putting all in order as I go on." Whether this refers to his herbarium or *Species Plantarum* is not very certain. The last reference I will give is April 13th, 1753, where he says: "The lectures now will stop in a fortnight. I am afraid that Salvius will overtake me in printing. Cryptogamia still

before me, and not a word of them written." Salvius was the printer of the *Species Plantarum*.

Singularly enough, a paragraph on p. 39, dated 1745, is supplementary to a short article in this Journal (August, 1910, pp. 193–195). Linné, writing to Bäck at Leipzig, says, amongst other scraps of news: "[Peter] Hamnerin has been created Physician in Ordinary to the King; so also has a surgeon's journeyman and a charlatan Englishman named Blackwell."

The letters included in this volume do not go beyond October, 1755, and are about three hundred in number; presumably, therefore, a similar volume will be required to take in the remainder of the Bäck letters.

B. D. J.

Stapelieen und Kleinien einschliesslich einiger anderer verwandta sukkulenten. Von ALWIN BERGER. Verlag von Eugen Ulmer in Stuttgart.

IN this book Herr Berger, well-known for his contributions to our knowledge of succulent plants, gives descriptions to many cases, illustrated and well illustrated, of a large number of such plants, especially Stapelias and their allies, many of which he has had under observation as curator of the late Sir Thomas Hanbury's garden at La Mortola. More than this, his work on the *Stapelieæ* has the nature of a formal monograph, embracing, as it does, keys to the various genera and descriptions of all the species known at the time of writing, together with the inevitable synonyms, as also a sprinkling of species new to science. The number of novelties brought into view during recent years in this tribe of *Asclepiadeæ* being very considerable, it is no matter for wonder that nearly three hundred and fifty pages should be required to do justice to the subject. Having dealt with the *Stapelieæ*, Herr Berger passes on to *Ceropegia*, not monographing this genus, but confining himself to descriptions of many of the species known in cultivation.

The latter part of the book is devoted to certain succulent *Compositæ* belonging to the tribe *Senecionideæ*. Here we cannot follow Herr Berger in retaining *Kleinia*, which comprises only succulent Senecios, and much less in including in it *Notonia*, a genus with style-arms quite different from those of *Senecio*. The fact cannot be too strongly emphasized that certain *Senecionideæ*, otherwise similar to outward appearance, differ greatly in their style-arms, *Othonna*, for instance, being easily distinguished in this way from *Senecio*, *Lopholæna* from both, and *Notonia* no less certainly from all three. We therefore think it a mistake to neglect this useful character, apparently without biological significance though doubtless of high genetic import, for characters founded merely on habit. This point, however, is of no moment to cultivators of succulents, for whom especially Herr Berger caters. Some notes on culture, it may be added, are appended and enhance still further the practical value of the book.

S. M.

Étude critique et expérimentale sur le Polymorphisme des Algues. By R. Chodat. Genève. 1909.

In this interesting publication, Professor Chodat analyses the views of many other authors on the subject of polymorphism in the Algæ, and shows that very conflicting statements occur, each supported by those from whom expressions of opinion have usually been regarded as authoritative. Professor Chodat discusses in particular certain statements made by Hansgirg on the lower forms of the *Chlorophyceæ* and *Myxophyceæ*. He also points out that similar statements made by Klebs relative to the *Desmidiaceæ* have been shown not to be supported by observed facts.

He sets out to answer the following questions:—"Are Algæ polymorphic? Is their polymorphism proved (or verified)? Are there, on the contrary, Algæ of remarkably stable character? Can one say with Hansgirg that in a general manner Algæ are polymorphic, or with Borzi and others that unicellular Algæ are not polymorphic states of higher Algæ?" He then gives the results of a considerable amount of experimental work on the lower forms of green Algæ. This experimental investigation is the most important part of Professor Chodat's work, as he has applied the method of pure culture to the elucidation of the problem of polymorphism. From this careful experimental work he concludes that there are many low types of green Algæ of a very stable character, and with his general conclusions (on p. 165) I thoroughly agree, as I have myself expressed similar views repeatedly during the past ten years.

The author's conclusions are as follows:—

"There are certainly Algæ which by their extreme variability merit the name 'polymorphic,' if by that name one understands that a plant presents itself under many aspects without change of nature. Consequently, in some measure, one is able to defend the thesis that Algæ are polymorphic; but their polymorphism is of the same order as that which is exhibited by most vegetation. As among higher plants, some are remarkably plastic and others only a little plastic; but in a general manner one is not able to defend the thesis formulated by Hansgirg. On the other hand, many studies starting from pure cultures, under various conditions, have shown that alongside the polymorphic Algæ there are always as many, if not more, which present a remarkable stability. For this reason we cannot believe that it is justifiable to speak in a general manner of a 'theory of polymorphism of Algæ.'"

The fourth chapter is devoted to a proposed "natural system of classification" for the *Chlorophyceæ* and *Phæophyceæ*, and this part of the work will probably receive much criticism.

The weakest part of the proposed classification is the inclusion within the *Phæophyceæ* of the *Confervales*, the *Peridinieæ*, the *Bacillarieæ*, and the *Euglenaceæ*. The first-named is the chief order of the *Heterokontæ*, a group now widely recognised as a very natural assemblage. The *Peridinieæ* and the *Bacillarieæ* are two groups of obscure affinities, possibly somewhat remotely allied to each other, but having nothing in common with the Brown Sea-

weeds. And, as regards the *Euglenaceæ*, there is little doubt that this family is a group of green flagellates which has terminated blindly, nothing of a higher nature having been evolved therefrom. The association of the *Pleurococcaceæ* with the *Ulotrichaceæ* and *Chætophoraceæ*, under the one series of "Pleurococcales," is also very questionable. The *Chætophoraceæ* are merely the branched forms of the *Ulotrichaceæ*, and the evolutionary series of the latter family, through *Geminella*, *Glœoila*, *Hormospora*, and *Stichococcus*, is almost perfect, the most probable origin of the lower types being from some of the *Palmellaceæ*, such as *Glœocystis* and *Dactylothece*, with thin cell-walls and simple parietal chloroplasts. It appears highly probable that the Algæ embraced in the *Pleurococcaceæ* have become adapted to special conditions without giving origin to higher types, the latter having evolved through the *Palmellaceæ*. Should this be so, then the inclusion of the numerous branched genera of the *Chætophoraceæ* in Chodat's series of the "Pleurococcales" would not be in keeping with their affinities. It is also difficult to find any reasons why the *Ulvaceæ* should be included in the Pleurococcales, and surely the author's inclusion of *Bulbochæte* in the *Coleochætaceæ* must be a slip; otherwise, it is a grave error of judgment.

I fully agree with Professor Chodat's retention of the *Conjugatæ* in the *Chlorophyceæ*, as this is the attitude I have always adopted towards this large group, as against Wille's separation of them from the rest of the green Algæ.

I must confess a dislike to Chodat's new names—*Meiotrichales*, *Pleotrichales*, and *Atrichales*. The two latter are synonymous, respectively with Blackman & Tansley's *Stephanokontæ* and *Akontæ*. Moreover, the use of the termination "trichales" or "trichaceæ" in the group-names of Algæ has so far had exclusive reference to hair-like branches and threads, and therefore its use purely in reference to cilia in the name of a large group must cause some confusion.

The twenty-three plates illustrating the work are very well executed, and the work as a whole is a valuable addition to our knowledge of the green Algæ.

G. S. West.

BOOK-NOTES, NEWS, &c.

All Prof. L. H. Bailey's books on gardening are interesting, and his *Manual of Gardening* (Macmillan & Co., New York, price 8*s*. 6*d*. net.) is one of the best he has done. It is true there is much in it that we have seen in some of his other works, but it is arranged differently and clothed with the fresh knowledge of later experience. The text runs into over five hundred pages, and is embellished with twenty-five good half-tone photographs representing either landscape views or special crops. In addition to the plates there are also three hundred and seventeen cuts, most of them good but a few of an impressionist character. Every

phase of outdoor gardening as practised in various parts of the United States is dealt with by Mr. Bailey, and his advice and instruction may be accepted as trustworthy in the great majority of instances. The author rightly guards himself from being held responsible for failures that his readers may suffer in carrying—or rather trying to carry—out his instructions; these are naturally of general application and may not be successful in particular instances or under special conditions; and he hopes that "no reader of a gardening book will ever conceive the idea that reading a book and following it literally will make him a gardener." Mr. Bailey gives an excellent index to his *Manual*, in which we note some peculiarities. Thus generic names when standing alone begin with a small letter, but when followed with a specific name with a capital letter—*calla*, *Calla palustris*. Again, when scientific names are used in a popular sense, or because they have become easy to pronounce, they have undergone a slight change in spelling: thus *Spiræa* becomes spirea; *Dracæna* becomes dracena; *Cobæa* becomes cobea, and so on. Taken altogether the *Manual* is a most readable and interesting book on a subject that ought to appeal to every householder and cottager, not only in the States, but throughout the English-speaking world.—J. W.

Mr. A. B. Jackson has compiled, at the request of the Duchess of Northumberland, a *Catalogue of Hardy Trees and Shrubs growing in the grounds of Syon House, Brentford*, which has been printed by Messrs. West, Newman & Co. in a neat little volume. The list is arranged alphabetically under the Latin names after the style of the Kew catalogues, and is interleaved with blank paper for additions: an "index of popular names" is added. A brief history of the Garden is given as a preface.

We regret to announce the death at St. Raphael on the 3rd of October, at the age of 58, of Dr. Melchior Treub, whose name is inseparably connected with botanical investigation at Buitenzorg; and of the Rev. William Hunt Painter, which occurred at Shrewsbury on the 12th, in the 76th year of his age, and of whose work we hope to give some account later.

Looking into the recently published *Letters of John Stuart Mill*, with a view to ascertaining whether his interest in botany found any place therein, the Editor was surprised to find one addressed "to J. Britten," described as "a sharp rebuke to an importunate correspondent." As, however, it was written in 1858, it is hardly necessary to say that the letter was not addressed to the Editor, but to "another man of the same name."

Newspaper Botany.—"The 'wild marsh marigolds' which furnish such a brilliant display of golden blossoms, gleaming in the September sunshine from the roadside ditches around London, are called by most country folk by the dreadfully prosaic name of 'fleabane.'"—*Westminster Gazette*, Sept. 22.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of June and July (Double Number).—The Inter-Relationships of the Bryophyta. III.—Anacrogynous Jungermanniales. Inter-Relationships of the Anacrogynæ. (Figs. 30–43), by F. Cavers. Adventitious Budding and Branching in *Cycas*. (Text-Figs. 8–14), by M. C. Stopes. The Rhizophore of *Selaginella*. (Text-Figs. 15, 16), by W. C. Worsdell. Note on a Wounded Myeloxylon. (Text-Figs. 17, 18a, 18b), by H. S. Holden. Two Embryo-Sac Mother-Cells in the Ovule of *Fritillaria*. (Text-Fig. 19), by A. E. Lechmere. The Brussels Congress of Botanists. *Review.*—Seeward's Fossil Plants, by D. H. S.

Subscription-Price, 15*s. per annum* (*ten numbers*) *post free.*
Price of single number, 2*s.* *Price of double number*, 4*s.*

Published Monthly by the Editor, The Botany School, Cambridge.

FOR SALE.—LARGE HERBARIUM belonging to the late J. W. Rimington. Can be seen by appointment. No reasonable offer refused. Apply to—

E. RIMINGTON, 85, CHURCH ROAD, NORWOOD, S.E.

---

144 pp. Price 3s. Postage 2d.

THE BRITISH ROSES

(Excluding Eu-caninæ).

By Major A. H. WOLLEY-DOD.

A few copies of this paper have been reprinted from the 'Journal of Botany.'

Price 2s. 6d., Postage 2d.

The Subsection Eu-caninæ of the Genus Rosa

By Major A. H. WOLLEY-DOD.

Demy 8vo. Price 1s. 6d.

Key to Genera & Species of British Mosses

By the Rev. H. G. JAMESON, M.A.

Demy 8vo. 118 pp., Price 3s.

A Supplement to Topographical Botany, Ed. 2.

By ARTHUR BENNETT, F.L.S.

London: WEST. NEWMAN & CO., 54 Hatton Garden, E.C.

PLANT LIFE IN ALPINE SWITZERLAND

BEING AN ACCOUNT IN SIMPLE LANGUAGE OF THE NATURAL HISTORY OF ALPINE PLANTS.

By A. E. NEWELL ARBER, M.A., F.L.S., F.G.S.,

Trinity College, Cambridge; University Demonstrator in Palaeobotany.

Illustrated by 48 Plates, containing 78 Photographs from Nature and 30 figures in the text. Crown 8vo. 7s. 6d. net.

This book is devoted to a discussion, in simple language, of the Natural History of Alpine Plants, their ways of life and the explanation of their peculiarities as adaptation to the special conditions of their existence. It is intended for the general reader, and primarily for the visitor to Switzerland, who wishes to know something more than the mere names of the plants which he may come across. It includes the results of much recent botanical research into these matters, expressed in a non-technical manner. A special feature of the work is the series of photographs of alpines, growing in their natural habitats.

JOHN MURRAY, ALBEMARLE STREET, W.

THE AVICULTURAL MAGAZINE

EDITED BY J. LEWIS BONHOTE, M.A.

To promote the study of Birds, both British and Foreign, in freedom and in captivity. Frequent Illustrations.

ANNUAL SUBSCRIPTION, 15s. POST FREE.

LONDON: WEST, NEWMAN & CO., 54, HATTON GARDEN.

Journal of Botany Reprints.

BOUND SEPARATELY IN PAPER COVER. PRICE 1s. 6d. POSTAGE 1d.

THIRD SUPPLEMENT

TO THE

BIOGRAPHICAL INDEX OF BRITISH & IRISH BOTANISTS.

254 PP., DEMY 8VO, CLOTH EXTRA, PRICE 9s. 6d. NET.

BIOGRAPHICAL INDEX

OF

DECEASED BRITISH & IRISH BOTANISTS.

BY

JAMES BRITTEN, K.S.G., F.L.S., & G. S. BOULGER, F.L.S.

BOUND UP TOGETHER WITH

FIRST (1893–97) & SECOND (1898–1902) SUPPLEMENTS.

The SUPPLEMENTS can also be had separately, price 1/6 each; postage 1d.

London: WEST, NEWMAN & Co., 54, Hatton Garden.

Subscriptions to the Journal of Botany (16s. post free) for 1911 become due this month, and should be sent to West, Newman & Co.

No. 576 DECEMBER, 1910 Vol. XLVIII

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

CONTENTS

PAGE

Merceyopsis, a new Genus of Mosses, with further Contributions to the Bryology of India. By H. N. Dixon, M.A., F.L.S. (Plates 507 & 508) 297

Colloderma, a new Genus of Mycetozoa. By G. Lister, F.L.S. ..31 0

Notes on Dartmoor Border Rubi. By the Rev. W. Moyle Rogers, F.L.S... 312

Additions to the Flora of Hongkong. By S. T. Dunn, B.A., F.L.S. .. 323

Three South Wales Hawkweeds. By Rev. Augustin Ley, M.A. .. 326

Lathyrus tuberosus in Britain. By J. C. Shenstone, F.L.S... .. 327

Short Notes.—Middlesex Plants—A new Variety of *Rosa hibernica*—The Pink Hybrid Campion—

PAGE

Erica vagans × *cinerea*—*Cochlearia micacea* in Peebles-shire—*Ruppia rostellata* in v.-c. 74 331

Reviews :—

Ancient Plants. By M. C. Stopes, D.Sc. 334

Plant Life in Alpine Switzerland: being an Account in Simple Language of the Natural History of Alpine Plants. By E. A. Newell Arber, M.A., F.L.S. 336

Anatomy of the British Carices. By Francis C. Crawford .. 339

Agricultural Bacteriology. By Prof. J. Percival, F.L.S. .. 341

Die Aufzucht und Kultur der Parasitischen Samenpflanzen. By Prof. Dr. E. Heinricher .. 343

Book-Notes, News, &c. 343

LONDON

WEST, NEWMAN & CO., 54, HATTON GARDEN, E.C.

DULAU & CO., SOHO SQUARE

Price One Shilling and Eightpence

The Index and Title-page for 1910 are issued with this number.

THE JOURNAL OF BOTANY

BRITISH AND FOREIGN

EDITED BY

JAMES BRITTEN, K.S.G., F.L.S.

The Journal of Botany was established in 1863 by Dr. Seemann. In 1872 the editorship was assumed by Dr. Henry Trimen, who, assisted during part of the time by Mr. J. G. Baker and Mr. Spencer Moore, carried it on until the end of 1879, when he left England for Ceylon. Since then it has been in the hands of the present Editor.

Without professing to occupy the vast field of general Botany, the Journal has from its inception filled a position which, even now, is covered by no other periodical. It affords a ready and prompt medium for the publication of new discoveries, and appears regularly and punctually on the 1st of each month. While more especially concerned with systematic botany, observations of every kind are welcomed. Especial prominence has from the first been given to British botany, and it may safely be said that nothing of primary importance bearing upon this subject has remained unnoticed.

Bibliographical matters have also received and continue to receive considerable attention, and the history of many obscure publications has been elucidated. Every number contains reviews of new and important books written by competent critics: in this as in every other respect a strictly independent attitude has been maintained. While in no way officially connected with the Department of Botany of the British Museum, the Journal has from the first been controlled by those whose acquaintance with the National Herbarium has enabled them to utilize its pages for recording facts of interest and importance regarding the priceless botanical collections which the Museum contains. In 1896 it became necessary to increase the size of the Journal, owing to the number of papers sent for publication: the number of plates was at the same time augmented.

Subscriptions (16s. post free) and advertisements (not later than the 24th of each month) should be sent to West, Newman & Co., 54, Hatton Garden, London; communications for publication and books for review to

The Editor, 41 Boston Road, Brentford.

The volumes for 1884 to 1895, bound in cloth, can still be had, price 14s. each, or £7 10s. the set. From 1896 to 1910, bound in cloth, can be had at £1 1s. each.

Cases for binding 1910 volume, and blanks for previous volumes can be had price 1s. 6d. each.

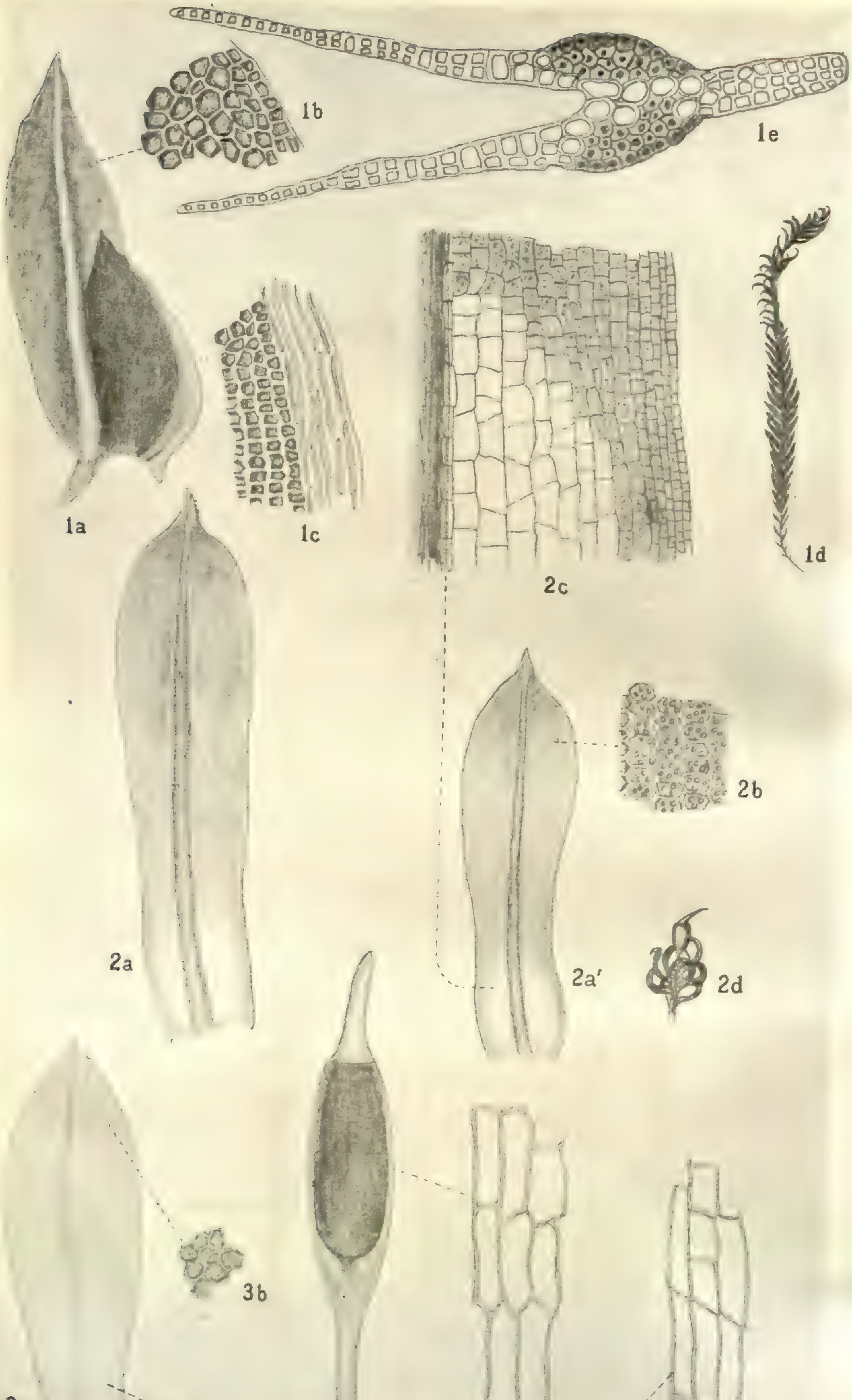
AUTHORS' SEPARATE COPIES.—Contributors are presented with six copies of their papers as printed in the Journal of Botany. Authors who require more are requested to order from the publishers, and to notify this and state the number required at head of their MS.; otherwise the type may be distributed before the order is received. The charges for special separate copies are as under:—

2 pages	25	copies	4s.	4 pages	25	copies	5s.	8 pages	25	copies	8s. 0d.
,,	50	,,	5s.	,,	50	,,	6s.	,,	50	,,	9s. 0d.
,,	100	,,	7s.	,,	100	,,	8s.	,,	100	,,	10s. 6d.

A greater number of pages to be charged in equal proportion. Separate Titles, Wrappers, &c., extra.

For articles supplied as printed in the Journal, and not re-made up, the charge is considerably less.

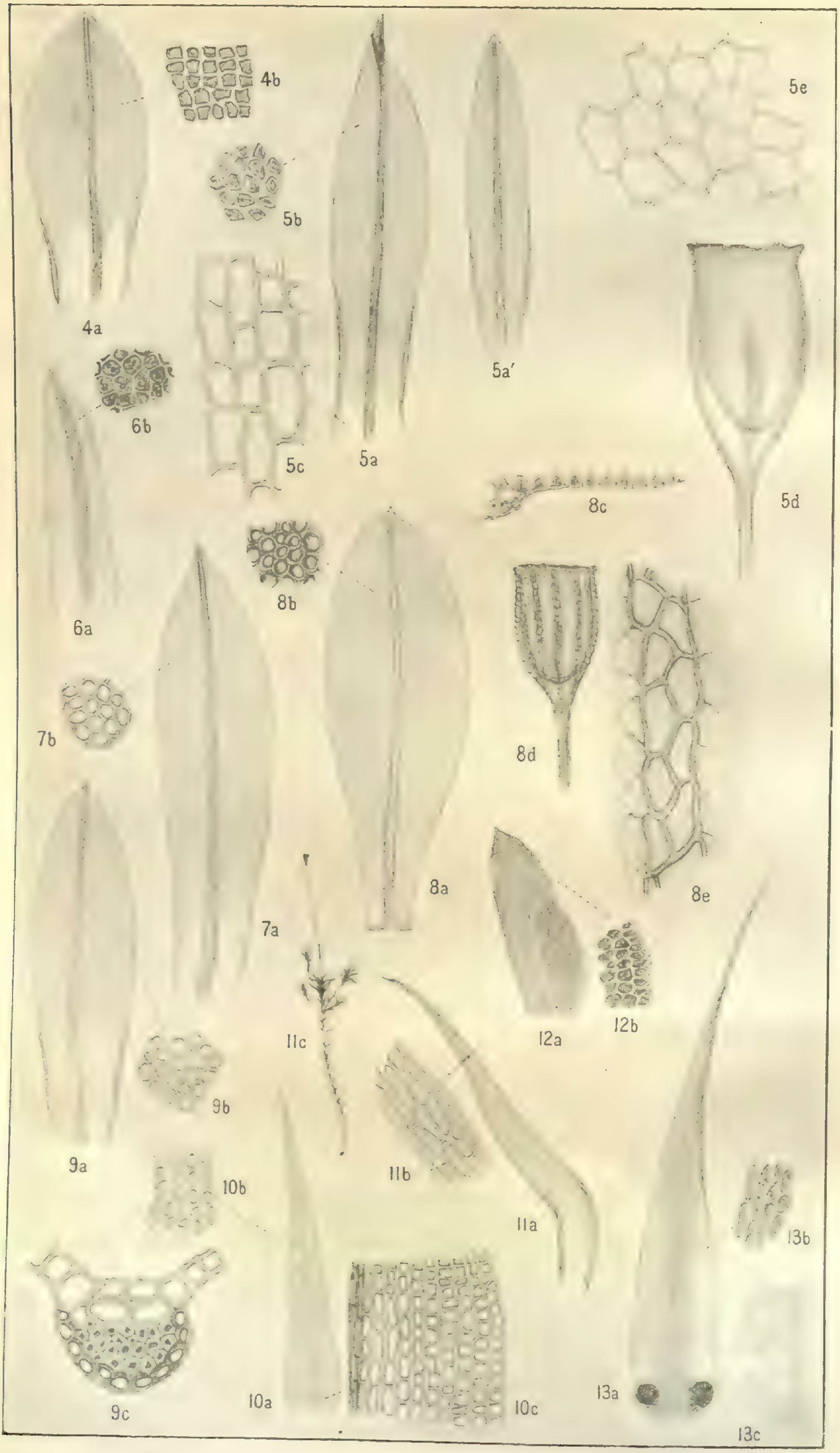
London: WEST, NEWMAN & Co., 54, Hatton Garden.



H. N. Dixon del.

INDIAN MOSSES.

West, Newman proc.



H. N. Dixon del.

INDIAN MOSSES.

West, Newman proc.

MERCEYOPSIS, A NEW GENUS OF MOSSES,
With Further Contributions to the Bryology of India.
(Plates 507 & 508.)

By H. N. Dixon, M.A., F.L.S.

In the number of this Journal for May, 1909, p. 157, I gave an account of some mosses received from Mr. L. J. Sedgwick from the Western Ghats. Since that time I have received further consignments, collected by Mr. Sedgwick, Lt.-Col. K. R. Kirtikar, I.M.S., and others, in the same district. I have also had for examination a small but interesting collection made by Dr. Eleanor Shepheard, of the London Missionary Society, during a short furlough in 1910 at Binsar, in the Almora district, at an altitude of 7000 ft. In addition to these, I have had from the New York Botanic Gardens a quantity of unnamed and of unpublished material of mosses from both North and South India, from Mitten's herbarium; as well as a few small collections from Ceylon and other parts of India. It has seemed desirable to treat these all together, which I hope to do in this and a subsequent article. An alternative method was to deal with the Northern Indian and the Southern in separate articles. But apart from convenience of reference, which is certainly consulted better by dealing with them unitedly, it is, perhaps, to the advantage of bryological study that the whole area in question should be treated as a single unit. I am, unfortunately, too unacquainted with the geographical distribution of the higher plants in the Indian continent to judge how far it is possible or desirable to treat the phanerogams as representing a single geographical area; but with regard to the mosses, it is certainly the case that whatever of fact may be brought to the surface by dealing separately with the north and south of India, such a treatment is likely to mask as much truth on the one side as it illustrates on the other. The moss flora of the higher altitudes of the Himalayas no doubt differs *toto cælo* from that of the plains of Southern India and Ceylon, but there is no clear dividing line as to species, far less as to genera, that can be drawn at any level of altitude or parallel of latitude, of which it can be said that on the one side lies a northern and on the other a southern moss flora. Taking, for intance, Mitten's *Musci Ind. Or.*, out of seventy-one recorded genera, six may be set aside as doubtful, and of the rest, forty-five are common to both north and south India, fifteen may be regarded as exclusively northern, and five only as confined to the southern parts; and several of the last two groups find common ground in Khasia and Nepal, which form notable meeting points of the two floras. Since Mitten's work, the limitations of genera have of course undergone a considerable change; but it is probable that under any system the above proportions would be but little altered. The treatment of south India (and especially the Neilgherries) as a totally distinct bryological area from that

of the Himalayas and temperate India has certainly led to the description of species as new, which cannot be fairly separated from already known species of the north; and it may probably serve some good end in this respect to treat the moss flora of the whole area, on occasion, as I have done here, as a single flora.

I have to express great indebtedness to Dr. Brotherus and M. Cardot for assistance in determining species, and also to the authorities of the British Museum and Kew for facilities of study.

Before dealing with the new material, I should wish to call attention to one regrettable error in my previous article. *Pterobryopsis kanarensis* was there described as a new species, but it proves to be identical with *Pterobryum Walkeri* Broth. (*Contrib. to the Bryol. Flora of S. India*; Calcutta, 1899, p. 324). In extenuation, it may be mentioned that the decurrent wings of the leaves, which appeared to us an important feature, are not referred to in the original description, while the "filis articulatis numerosis" there described were not discoverable on our plant. On a subsequent gathering, however, sent by Mr. Sedgwick, these axillary brood organs were found in profusion; and an examination of authentic specimens of *P. Walkeri* revealed the identity of the two plants. The name *P. kanarensis* must therefore be abandoned.

Among the later gatherings sent by Mr. Sedgwick was a sterile plant apparently belonging to *Merceya*, which was provisionally named by Dr. Brotherus *Merceya pellucida*, n. sp. In drawing up the description, however, it transpired that the nerve section was not that of *Merceya*, which is conspicuous in having the "Deuter" cells on the ventral face of the nerve, while in the present case they were median, as in *Hyophila*. This led to the comparison of other plants, including a considerable amount of unpublished material in Dr. Brotherus' herbarium, and an unnamed plant of Mitten's from Java; and in the end the characters held in common appeared to justify the inclusion of all in a new genus, for which the name of *Merceyopsis*, in reference to its close alliance and resemblance to *Merceya*, seemed appropriate.

Merceyopsis Broth. & Dixon, gen. nov. Pottiacearum.

Musci humiles, cæspitosi vel gregarii in rupibus præcipue calcareis crescentes, raro lignicoli. Caulis pergracilis; *fasciculo centrali nullo*, reti interno pauco, laxo, leptodermi, corticali densiore, plus minusve incrassato, rubro; simplex vel ramosus, sat dense sæpe interrupte nodoso-foliosus. Folia sicca sæpissime crispata, madida plerumque patentia, *late lingulata vel subspathulata*, plerumque obtusiuscula. Costa sat valida, dorso prominens, cellulis ventralibus paucis magnis, dorsalibus minoribus bene distinctis, ducibus 2–3 *centralibus*, fasciculo stereidarum inferiore magno, totam fere costam occupante. Areolatio Hyophilæ. Folia perichætialia vix diversa. Theca ei Merceyæ similis, *elliptica, leptodermis*, exothecii cellulis *magnis, subhexagonis*, plerumque isodiametricis. Operculum longirostre. Peristomium *nullum*. Spori minuti, læves.

A genus of small, mostly rupestral mosses, intermediate in character between *Merceya* and *Hyophila*. From the former they differ principally in the nerve section with median, not ventral Deuter-cells, and the areolation Hyophiloid, without differentiated marginal cells and with the basal hyaline cells rarely reaching high up in the leaf. From *Hyophila* in the absence of central strand, the capsule elliptic, not cylindrical, with the exothecium composed of thin-walled lax hexagonal cells, not rectangular and incrassate. The figures of the capsules in the two genera (Tab. 507, 3*d*, *e*; 508, 5*d*, *e*) will help to illustrate this character.

The following may serve as a key to the species:—

1	Capsule angled	*angulosa*
	Capsule smooth	2
2	Capsule narrowly elliptic; leaves acute...	*sikkimensis*
	Capsule widely elliptic, wide-mouthed	3
3	Upper cells papillose, basal reaching high up in the leaf...	*longirostris*
	Upper cells smooth, basal few, rarely occupying more than one-fourth of the leaf	4
4	Leaves small, less than 2 mm. long, incurved when dry	*hymenostylioides*
	Leaves above 2 mm. long, crisped when dry	5
5	Upper cells rounded, incrassate, pellucid	6
	Upper cells angular, scarcely incrassate	7
6	Leaves obtuse or very shortly pointed; rectangular basal cells very few	*pellucida*
	Leaves acutely pointed, basal cells numerous, distinct ...	*angustifolia*
7	Cells of exothecium 25–50 μ wide	*minuta* (type)
	Cells of exothecium 12–25 μ wide	var. *subminuta*

Of the seven species which we refer to this genus five are new and are described below; one is a hitherto undescribed species determined as *Scopelophila sikkimensis*, sp. n., by C. Müller, the remaining one being described by Mitten (Musci Ind. Or.) as *Desmatodon longirostris* (Griff.). I have examined a specimen of this in the British Museum, in Herb. Hampe, "*Hyophila Griffithiana* Hpe., = *Desmatodon longirostris* Jaeg." (Hampe in sched.), and also the specimen in Wilson's herbarium, and find that it certainly belongs here. It differs from the other species in the upper cells obscure with fine papillæ, and the basal cells extending for a considerable distance up the leaf; but the form and structure of the capsule, &c., are precisely as in the present genus.

It may be remarked that the combination *Hymenostylium longirostre* Griff., cited by Paris (Index Bry.), was not employed by Griffith and has not been used.

1. **Merceyopsis longirostris** (Griff.) Broth. & Dixon.

Syn. *Gymnostomum* (section *Hymenostylium*) *longirostrum* Griff. Not. p. 395 (1849).

Gymnostomum longirostrum Griff. Icon. Plant. Asiat. ii. t. xcv. f. iii. (1849).

Desmatodon longirostris Mitt. M. Ind. Or. p. 37 (1859).

Hyophila Griffithiana Hampe MS. in Herb.

Hab. Khasia, *Griffith*.

2. **Merceyopsis minuta** Broth. & Dixon, sp. nov. (Tab. 508, fig. 4.) *Gracilis*, laxe cæspitosa, *elatiuscula*, ad 2 cm. alta; superne saturate viridis, inferne straminea vel rufescens, parce radiculosa. Caulis tenuis, plerumque ramosa. Folia *sat laxe* disposita, sæpe interrupte nodosa, superiora comata, patula, sicca valde crispata, 2 mm. longa, ·5–·75 mm. lata, *late vel anguste lingulata vel spathulata*, apice rotundato-obtuso vel brevissime acuto, margine superne plano, ad infimum tantum basin recurvo, integro. Costa basi valida, superne angustata, infra summum apicem soluta. Areolatio superne minuta, chlorophyllosa, *subobscura*, cellulis 5-8 μ latis, hexagono-quadratis, *angulosis*, parietibus sat tenuibus firmis; inferne *ad quartam partem* folii (vel minus), laxa, hyalina, e cellulis late rectangularibus, pellucidis, laxis composita, marginalibus *in* 3-6 *seriebus minoribus, chlorophyllosis*. Folia perichætialia bina, breviora. Autoica. Seta terminalis, 3 mm. longa, flava; theca late ovalis, collo brevi bene distincto, operculo longirostri, $\frac{1}{2}$–$\frac{2}{3}$ thecæ longitudinem æquante; leptodermis, *pallide flavescens*, ore aurantiaco; exothecii rete laxissimum (25–50 μ), parietibus tenuissimis, apud orificium cellulis 2–3 seriebus parvis, quadratis, aurantiacis. Spori 8–10 μ, læves.

Hab. N. W. Himalaya, below Mussoorie, 4–6000 ped., 12 Sept., 1895; leg. J. F. Duthie. Mussoorie, 1899; leg. Gollan (Bryotheca E. Levier, nos. 5037, 5041). Mussoorie, 1901; leg. Amar Singh (Bryoth. E. Levier, nos. 5034, 5040). Simla, 1900; leg. Duthie (Bryoth. E. Levier, no. 3104). Kumaon; leg. Kabir Khan, 1900 (Bryoth. E. Levier, nos. 1850, 1951). Tihri Garhwal, 1882; leg. Duthie (*Desmatodon longirostris* Mitt. det. Geheeb). Mussoorie, 6–7000 ped., 2 July, 1895; leg. Duthie. Mussoorie, Dhanoulli, Mar. 1901; leg. Amar Singh (Bryoth. E. Levier, no. 3294). Mussoorie, Skinner's Park, Nov. 1899; leg. Gollan (Bryoth. E. Levier, no. 5035). Kumaon, Gozi R., 12,000 ped.; leg. Kabir Khan, Aug. 1900 (Bryoth. E. Levier, no. 1855). Darjeeling, Nov. 1908; leg. Rhomeo, pro E. Long (Bryoth. E. Levier, no. 7918, sub nom. *Merceyæ sikkimensis*).

Var. SUBMINUTA Broth. & Dixon.

Syn. *Merceya subminuta* Broth. in Philippine Journ. of Science, vol. v. no. 2, Section C, Botany, p. 143 (1910).

Theca *minus leptodermis, fuscescens, reti minore* (12–25 μ lato), firmiore.

Hab. Philippines, Luzon, Province of Benguet, Kabayan, *Merrill*, no. 4993.

M. minuta is a smaller and more delicate plant than most of the species here described, and varies considerably in the width and degree of acuteness of the leaves, and in the development of the hyaline basal cells. The angular upper cells, rendered somewhat obscure by the narrowness of the cell walls will distinguish it from all the species except *M. longirostris*, which is distinct in the densely papillose cells (though Mitten describes them as "sublæves") and the basal cells reaching higher in the leaf.

The texture of the capsule, composed of much smaller cells with firmer walls, appears to be the only constant difference

between the Philippine plant and the Himalayan, and it seems perhaps best to consider it a varietal form.

3. **Merceyopsis pellucida** Broth. & Dixon, sp. nov. (Tab. 508, fig. 9.) Dioicum? Flores et fructus ignoti. Dense pulvinata, mollis, 1–2 cm. alta, superne saturate viridis, intus rufescens, *valde tomentosa*. Caulis fragilis, *multo divisus*, ramis perbrevibus. Folia conferta, *pellucida*, comalia patula, sicca incurvo-crispata, 2–2·5 mm. longa, ·5 mm. lata, e basi angusto elongate late lingulata vel obovata, vix spathulata, *brevissime acuta vel subobtusa*; margine integro, raro ad apicem indistincte sinuate denticulato, plano, ad infimam tantum basin breviter angustissime reflexo. Costa ad basin valida (50–60 μ) sub-percurrens. Cellulæ *omnes fere æquales subrotundæ, incrassatæ*, 5–8 μ latæ, læves, *pellucidæ*, basin versus *parum majores, ad folii insertionem tantum paucis seriebus majores* rectangulares, pellucidæ, haud incrassatæ. Cetera ignota.

Hab. On the roof of a cave, Panchgani, W. Ghats, Feb. 1909; (no. 35); and underneath stone ledges, Panchgani (no. 33); leg. L. J. Sedgwick.

A more robust and much more branched plant than the others of the genus. This and the following are distinguished by the rounded, incrassate cells, not obscure nor chlorophyllose, but pellucid. From the following the present species differs in the wider, more obtuse leaves, with the basal retangular cells very few in number.

4. **Merceyopsis angustifolia** Broth. & Dixon, sp. nov. (Tab. 508, fig. 5.) Dense cæspitosa, habitu *M. pellucidæ* sed *multo minor*, minus ramosa. Folia conferta, *angustiora*, 2–2·75 mm. longa, *vix 5 mm. lata*; *anguste lingulata, superne parum latiora, ad apicem angustata, acuta vel subacuta*; costa valida, infra apicem abrupte soluta. Areolatio superior *M. pellucidæ*, vel paullo major (5–10 μ), ad basin *laxior, cellulis rectangularibus pluribus*, pellucidis, eis *M. minutæ* fere similibus. Seta 4 mm. longa, theca parva, elliptica, pallide fusca; exothecii cellulæ 30–40 μ latæ, parietibus sat firmis. Folia perichætialia bina, multo breviora.

Hab. Mt. Pangerango, Java, 7–10,000 ped.; leg. Motley; in Herb. Mitten, sine nomine; nos. 14, 15, 16, 17, 18.

Well marked in its areolation from its congeners, excepting only *M. pellucida*, which is closely related, and with which it may possibly have to be ultimately united; but the Panchgani plant is very constant in its wider, more obtusely pointed leaves, and especially in the basal areolation, and will, I believe, probably prove to be distinct.

5. **Merceyopsis sikkimensis** (C. M. ined.) Broth. & Dixon, sp. nov. (Tab. 508, fig. 7.)

Syn. *Scopelophila sikkimensis* C. M., MS. *in litt.* ad E. Levier, Apr. 1897.

S. hyophiloides Broth. MS. *in sched.*

Robustior, elata, ad 3 cm. alta. Folia sat conferta, minus distincte comata, *2·5–3 mm. longa*, e basi angustior, elongate lingulata, superne paullo latiora nec autem spathulata, *acuta*;

margine prope basin recurvo; costa valida, dorso prominens, vix percurrens. Areolatio *major*, cellulis bene distinctis, incrassatis, in seriebus sat regularibus dispositis, elliptico-rotundis, 8–12 μ, lævibus. Seta 3·5–4; 5 mm. longa, theca *angustior*, *elongate anguste elliptica*, orificio sæpe paullo contracto, leptoderma, siccitate leviter plicata.

Hab. Sikkim, Kurseong, 1900 m., Oct. 1895; leg. Rev. Bretandean; det. C. Müller sub numero 1699 (Bryotheca E. Levier) (sub nomine *Scopelophilæ sikkimensis*). Sikkim (Bryoth. E. Levier, nos. 7605, 7606, 7607, 7608). Prope Kurseong, 5500 ped., 1899; leg. Decoly and Schaul (Bryoth. E. Levier no. 2337). Kurseong; leg. Decoly (Bryoth. E. Levier, nos. 315, 437). Sikkim, prope Kurseong, 6000 ped., Aug. 1899; leg. Decoly and Schaul (Bryoth. E. Levier, no. 2330). A form with very narrow leaves, which may perhaps prove ultimately to be worthy of varietal rank.

M. sikkimensis is allied to *M. minuta*, but is much more robust, with longer, more acute leaves, larger areolation, and larger, narrower capsule with narrower mouth.

6. **Merceyopsis hymenostylioides** Broth. & Dixon, sp. nov. (Tab. 508, fig. 6.)

Syn. *Merceya hymenostylioides* Broth. MS. in sched.

Late cæspitosa, pusilla, *sordide viridis*; caulis brevis, subsimplex, tenuis. Folia *parva*, laxa, apicalia plus minusve comata, patentia, sicca marginibus valde involutis *fortiter incurva nec crispata*; caulina breviter comalia longius *lingulato-lanceolata*, apice breviter abrupte subacuta, 1–1·75 mm. longa, ·25 mm. lata, marginibus planis, integris. Costa vix percurrens, *lata* (35–50 μ), nec crassa nec dorso valde prominens, sectione transversa late transverse elliptica, duces 4 magnos exhibens. Areolatio sat densa, *opaca* (nec obscura), *minuta*, 6–9 μ lata, haud incrassata, ad infimam basin hyalina, elongate rectangularis, parietibus *tenuissimis*. Theca straminea, ore aurantiaco, breviter late elliptica, collo brevissimo distincto, orificio lato.

Hab. Simla, on walls, 6900 ft., 26 May, 1906; leg. E. Long (Bryoth. E. Levier, no. 7206, sub nom. *Merceya hymenostylioides* Broth.).

Quite distinct in the habit, in the leaves strongly enrolled and incurved but not crisped when dry, in the outline of the leaves, the stout nerve, and the delicate basal areolation.

7. **Merceyopsis angulosa** Broth. & Dixon, sp. nov. (Tab. 508, fig. 8.) Pusilla, atro-viridis, ætate rufescens; caulis perbrevis, subsimplex. Folia conferta, patentia; siccitate *tubulosa*, *fortiter incurva*, *nec crispata*, subnitida; e basi perangusta *late obovata vel spathulata*, pellucida, concava, *obtusa*, *apiculata*, marginibus planis, costa in apiculum brevissimum exeunte. Areolatio bene distincta, sat incrassata, cellulis 8–12 μ latis, rotundis, *in pagina ventrali folii valde mammose protuberantibus*, dorso æqualibus, omnibus lævissimis. Seta 4–5 mm. longa, theca minuta, ovalis, brunnea, *8-costata*, costis e binis seriebus cellularum incrassatarum alternis juxtapositarum efformatis, exothecii cellulis

inter costis laxis, parietibus tenuissimis. Stomata in una serie disposita bene evoluta. Spori 8–10 μ, lævissimi.

Hab. Sikkim, Punkabari, prope Kurseong, 2000 ped., 16 Dec. 1899; leg. Decoly and Schaul (Bryoth. E. Levier, no. 2336, sub nom. *Scopelophila sikkimensis*).

Remarkable for, and at first glance distinguished by, the eight-angled capsule, the ribs formed of a curiously alternating double row of cells (*cf.* fig. 8*e*); the spathulate, widely obtuse and apiculate leaves, with the mammosely protuberant cells on the upper surface, are also marked characters.

In the following list the order and nomenclature of Brotherus (in Engler and Prantl, *Pflanzenfamilien*) are followed.

Ditrichum tortipes (Mitt.) Par. Binsar, Almora, 1910; leg. Miss Shepheard (no. 15), c. fr. The specimens in the British Museum exhibit considerable variation in length of capsule, width of mouth, and in the apex of the leaf, which may be entire or faintly or more distinctly denticulate.

Campylopus Goughii (Mitt.) Jacq. On rotten wood of trees (common), and inside hollows in trees, Mahableshwar, Western Ghats, Jan. 1909; leg. Sedgwick (nos. 18, 19, 20), c. fr.

I have not seen a specimen of Mitten's actual type from the Neilgherries, but most of the other plants quoted by him are in the British Museum, and some of them agree exactly with Sedgwick's specimens. There is a considerable degree of variation in size and habit, in areolation, and in capsule, but the differences do not appear to be correlated together or with any geographical distribution of the forms. Thus no. 79*b*, Sikkim, Hooker (Herb. Hooker & Thomson), is a very slender plant, with finely acuminate leaves; while no. 79, Sikkim, in the same collection, is a much more robust plant, with somewhat different areolation; but no. 86 (Khasia, Churra) is intermediate between the two in habit and cell structure. And the same range of variation is shown in the Ceylonese plant. The capsule in Sedgwick's plant is rather large and turgid and quite smooth. This is also the case with several of Mitten's plants, while in others it is lightly plicate. Obviously *C. Goughii* is a plant of wide distribution in India and a wide range of forms, with a very considerable degree of variation in its areolation; and it may be compared with *C. flexuosus* in Europe in these respects.

Campylopus (Trichophylli) **Sedgwickii** Card. & Dixon, sp. nov. (Tab. 508, fig. 13.) Sat *robustus*, *elatus*; caulis 5–8 cm. longus, pluries divisus, fragilis, *parce brevissime radiculosus vel subnudus*, *ad basin decumbens*, *inde abrupte geniculatus erectus*. Late intricate cæspitosus, superne olivaceo-viridis vel aurescens, subnitidus, inferne fuscus; sat laxe, interrupte foliosus. Folia siccitate suberecta, substricta, madore erecto-patentia subrecurva, 6–7 mm. longa, prope basin ad 1 mm. lata, e basi late oblonga concava in subulam longam canaliculatam integerrimam sensim angustata, apice tubuloso, foliorum inferiorum mutico, comalium sat breviter sed distincte *in pilum hyalinum spinulosum* desinente.

Costa *lata*, male definita, prope basin *circa* $\frac{2}{3}$ *folii latitudinem* occupans, dorso *humiliter lamellato*, cellulis ventralibus *magnis*, inanibus. Areolatio laminæ densa, minuta, opaca, e cellulis ovato-rhomboideis, obliquis, *viridibus*, *haud incrassatis* instructa; alaribus numerosis, rufis, sat parvis, quadratis (marginalibus elongatis angustis, parietibus tenuissimis, plerumque hyalinis), *auriculas magnas inflatas perdistinctas* formantibus; supra-alaribus *sat numerosis*, *parvis*, *rectangularibus*, *pellucidis*, *teneris*, *versus marginem angustissimis*, *ab illis laminæ superioris bene distinctis*. Cetera ignota.

Hab. Common on the ground, 4000–4500 ft., Mahableshwar, W. Ghats, Jan. 1909; leg. Sedgwick (no. 56), st. Nuwara-Eliya, near Galle, Ceylon, March, 1898; leg. J. H. Darrell (no. 134*a*), st.

Most nearly allied to *C. Schmidii* (C. M.) and *C. erythrognaphalon* (C. M.); the former, however, is quite different in habit, and with very different areolation at base and angles. *Dicranum erythrognaphalon* C. M., which I have not seen, is, according to the description, distinct in having the stems densely interwoven with purple tomentum, a character upon which the author lays stress; in the yellowish colour, the stems recurved (here geniculate), the nerve smooth at back, the suprabasal cells hexagonal, the alar lax, the upper incrassate and yellowish.

Campylopus Walkeri (Mitt.) Jaeg. Binsar, Almora, 1910; leg. Miss Shepheard (no. 19), st. Growing in large, low patches, very soft and delicate, with small, finely subulate leaves. The description of *Dicranum Walkeri* Mitt. (M. Ind. Or. p. 18) seemed to fit it very exactly, with the exception that Mitten writes of "innovationibus tenuibus appressifoliis subjulaceis infra perichætium comosum orientibus," which were not present in Miss Shepheard's plant, as indeed, in the absence of perichætia, was to be expected. An examination of Mitten's plants in the British Museum showed, however, that the above description requires modification. Walker's specimens there, from Ceylon, are taller, and do show somewhat short-leaved innovations, with the leaves erect and to some extent appressed; but they cannot be described as subjulaceous, and are altogether a much less striking feature of the moss than one would perhaps assume from the description. And further, the only other specimen, labelled "Thw. 21, Central Provinces, Ceylon," presumably determined by Mitten, is a much shorter plant, without any of these innovations, and quite agreeing both in habit and leaf-structure with the Binsar plant. Mitten no doubt had recognized the slight value of the character above referred to, and Miss Shepheard's plant may safely be referred to *C. Walkeri*.

Pilopogon Blumii (Dz. & Mb.) Broth. On earth-banks, Fort Parandhar, Poona District, May, 1910; leg. Sedgwick (no. 82), st. Only differs from the usual form of this species in having the dorsal lamellæ of the nerve very slightly developed. I do not know why descriptions often speak of the alar cells being poorly characterized; they are frequently, if not usually, very well marked and conspicuous.

FISSIDENS CRENULATUS Mitt. (Tab. 508, fig. 12.) Stones in the bed of a torrent, Mahableshwar (no. 23*a*); on red earth, banks under tree roots, Mahableshwar (no. 40); red earth cutting by road, 4000–4500 ft., Mahableshwar (no. 60); all leg. Sedgwick, Jan. 1909, c. fr. These plants all agree with one another, and show little variation except in the degree of acuteness of the leaves, which varies within a narrow range only. They agree quite well with "H. 1170, Nepal, Wallich, *F. commutatus* Wils. MS., *F. crenulatus* Mitt.," the type of Mitten's species, in the British Museum. One marked and characteristic feature is the abrupt ending of the dorsal lamina at the base of the leaf (v. fig. 12*a*).

Fleischer (Musci . . . von Buitenzorg, i. 31) places *F. crenulatus* Mitt. as a possible synonym of *F. simplex* C. M., which again he ranks as a subspecies of *F. ceylonensis* Dz. & Mb., describing it as having the same areolation as that species. The areolation in *F. ceylonensis* is, however, peculiarly opaque and obscure, "*ganz undurchsichtig*, wie bei keiner anderen Art" (Fl.). In Mitten's plants, however, the cells, while having the lumen opaque, are quite distinct, and it does not differ in that respect from many of its congeners, and in other respects appears distinct from *F. ceylonensis*. I incline to think therefore that *F. crenulatus* Mitt. is a good species, and not to be sunk under *F. simplex* or *F. ceylonensis*. A specimen from Assam, in Hampe's herbarium, labelled *F. crenulatus* Mitt., is quite a different thing, and may have given rise to a false conception of what Mitten's plant really is.

The exothecium cells in *F. crenulatus* are remarkably collenchymatous.

F. Walkeri Broth. In the bed of a torrent course, Waishakhan, Western Ghats, Feb. 1909; leg. Sedgwick (no. 29), c. fr. An earlier gathering was recorded in my previous article, as showing a slight difference from the original description in the entire margin of the leaves. The present plant has the minute crenulation exactly as there described. The spores measure 30–45 μ, and are smooth or almost so.

F. Zippelianus Dz. & Mb. On a wall, Poona, July, 1909; leg. Sedgwick (no. 71), c. fr. A small form; not *F. aculeatus* Fleisch., as the nerve always ceases below the apex.

Fissidens (PACHYFISSIDENS) **Sedgwickii** Broth. & Dixon, sp. nov. (Tab. 507, fig. 1.) Dense late cæspitosus, valde rigidus, superne *atro-viridis vel brunnescens, inferne rubiginosus*. Caulis simplex vel parcissime divisus, 2–4 cm. longus; fasciculo centrali nullo, cellulis externis pluribus seriebus valde incrassatis, rufescentibus. Folia multijuga, patentia, sicca juniora falcata, decurva, ætate stricta, complanata; circa 2 mm. longa, *ovato-oblonga*, acutiuscula, lamina dorsali folii basin attingente, laminis vaginantibus *multo latioribus*, circa dimidiam partem folii æquantibus, *limbatis, limbo inferne lato, valido*, ante apicem laminæ soluto, ceterum margine elimbato integro, superne subundulato. Costa valida, subpercurrens, pellucida. Areolatio densa, minuta, obscura, e cellulis incrassatis, 8–10 μ latis, hexagono-rotundis instructa. Laminæ vaginantes plerumque e 1–2 stratis solum cellularum compositæ,

inde in sectione transversa eis *F. grandifrontis multo tenuiores.* Dioicus. Fl. ♂ (unus solum inventus) parvus, bracteis brevibus, cuspidatis, antherideis paucis, elongatis. Flores ♀ in ramulis propriis ad foliorum superiorum axillas sub fronde conditis basi radicantibus numerosi, archegoniis parvis, multis (12–16), bracteis perichætialibus internis superne linearibus, laminis vaginantibus suborbicularibus, anguste limbatis. Cetera ignota.

Hab. On stones near a fall known as the Dhobis' Waterfall, Mahableshwar, Jan. 1909; leg. Sedgwick (no. 51), st.

A fine species, quite distinct from all others of the section *Pachyfissidens* in the shorter, wider leaves with stout border to the lower part of the vaginant lamina. The other Oriental species of the section are quite distinct, and for the most part do not differ greatly from *F. grandifrons* Brid.

Calymperes (Hyophilina) **tortelloides** Broth. & Dixon, sp. nov. (Tab. 507, fig. 2.) Dioicum. Dense cæspitosum, atro-viride, inferne sordido-fuscum; caulis decumbens, ramis ascendentibus, fastigiatis, circa 3 mm. longus. Folia sat conferta, e basi erecto albescente patentia, sicca valde convoluta cirrata, *dorso nitida*, fragillima, e basi *oblonga, angustior, elongate lingulato-spathulata, apice breviter acutata vel in cuspidem crassum acutum plus minusve elongatum subito contracta*; margine *plano*, integro; costa valida, 60–70 μ lata, apud apicem folii tantum angustata, percurrens vel in cuspidem crassum sæpe papillosum excurrens; in sectione *transverse elliptica*, cellulis ventralibus numerosis *sat magnis*, ducibus 5–6 centralibus, *stereidearum fasciculis duobus*, cellulis dorsalibus parvis. Inter folia normalia alia nonnulla perangusta elongate ligulata inveniuntur. Areolatio in parte folii superiore *opaca, subobscura*, valde chlorophyllosa, *dense sed humiliter papillosa*; cellulæ quadratæ vel subhexagonæ, regulares, 8–10 μ latæ, parietibus tenuibus, firmis; basilares juxta costam magna, rectangulares, hyalinæ, marginales seriebus pluribus anguste lineares, chlorophyllosæ, *cancellinam circa quartam partem folii occupantem* circumscribentes.

Folia perichætialia e basi longiore, hyalino, elongato-lingulata. Theca *immersa vel subexserta*, parva, ovata, castanea, nitida, ·75 mm. longa; versus orificium aurantiacum paullo contracta, gymnostoma; exothecii cellulæ irregulares, haud elongatæ, sat magnæ, parietibus pertenuibus; sub ore 3–5 seriebus parvæ transverse compressæ, incrassatæ, intensius coloratæ. Operculum *longirostre* (vaginula, seta, sporangium, operculum, omnia subæquilonga). Spori 10–14 μ, læves. Calyptra haud visa.

Hab. On trees, 4000–4500 ft., Mahableshwar, Western Ghats, Jan. 1909; leg. Sedgwick (no. 54), c. fr.

A very distinct species, in habit and foliation closely resembling members of the *Pottiaceæ* (whence the specific name); and not likely to be mistaken for any of the Indian or Malayan species of the genus. It is perhaps nearest to *C. Motleyi* Mitt. and *C. tenerum* C. M., but the leaf outline and apex are quite different, and the areolation distinct. The upper and outer cells of the *Cancellina* pass more gradually than is often the case into the

smaller chlorophyllose ones, which again heightens the resemblance to the *Pottiaceæ*.

CALYMPERES FORDII Besch. On tree-trunk, Salsette I., Bombay (no. 67); and on stem of a toddy palm, Salsette I., Bombay (no. 68), Dec. 1908; leg. Sedgwick, st. I have compared these plants with Bescherelle's Hongkong specimens, and they agree closely; in the original plant the leaf-base is slightly more differentiated, with, as a rule, 3–5 rows of marginal cells outside the teniola at the shoulder, while in the Indian plant there are usually 1–2 rows only. Some of Bescherelle's leaves, however, show precisely the same structure, with only two rows of marginal cells. No. 68 is a rather taller plant than 67, with the teniola a little less distinct and not reaching quite so high up in the leaf, and also with the leaf-base more conspicuous, in this respect resembling *C. Hampei*, but a more robust and rigid plant. Both specimens have the leaves a little wider than in Bescherelle's plant, and perhaps should be referred to var. *javanicum* Fleisch. But the difference is slight, and scarcely, I think, worth a varietal name; indeed, at the best, *C. Hampei*, *C. Fordii*, and *C. Thwaitesii* are very closely allied plants, and their differences by no means easy to define.

C. Fordii has only been recorded, I believe, from Hongkong and from West Java.

HYMENOSTOMUM EDENTULUM (Mitt.) Besch. On stones, Panchgani, 4000 ft., Western Ghats, Feb. 1909 (no. 47); rocky banks, Fort Purandhar (no. 80*c*), and earth-bank, Fort Purandhar, Poona District, May, 1910 (no. 86); all leg. Sedgwick, c. fr.

No. 47 is a very robust plant, larger in all its parts than in Mitten's type; but I can find no structural difference; and the two differ no more than do forms of *H. tortile* with us. Moreover *H. Pancherianum* (Besch.) Jaeg., which Fleischer unites with *H. edentulum*, is as much smaller than the type as no. 47 is larger. No. 80*c* is the normal form, while 86 is a little larger, but not nearly so robust as 47.

HYMENOSTYLIUM XANTHOCARPUM (Hook.) Brid. Damp ground, Mahableshwar, W. Ghats, May, 1907; leg. Lt.-Col. Kirtikar (no. 72), c. fr. Rocky banks in shade, Fort Purandhar, Poona District, May, 1910; leg. Sedgwick (no. 80*b*), c. fr.

Hymenostylium Shepheardæ Card. & Dixon, sp. nov. (Tab. 508, fig. 10.) Densissime cæspitosum, supra flavescens, intus rufum, basi radiculis intertextum, 3–4 cm. altum; caulis tenuis pluries divisus, *pulchre interrupte nodoso-foliosus*; folia erecto-patentia, vix 2 mm. longa, *sicca arcte contorta*, *angustissime lineari-lanceolata*, *acutissime acuminata*, concavo-carinata, marginibus *planis*. Costa sat valida, dorso prominens, lævis, in cuspidem brevem peracutam excurrens. Areolatio per totum folium *parva*, *brevis*, e cellulis superne ovato-rotundis incrassatis pellucidis lævibus instructa, *ad infimam basin tantum juxta costam paucis breviter rectangularibus pellucidis*. Fructus ignotus.

Hab. Binsar, 7000 ft., Almora, 1910; leg. Miss E. Shepheard (no. 13), st.

Very distinct in the interrupted foliation, the finely acuminate, narrow leaves, and small cells, short even to the base.

Hymenostylium annotinum Mitt. MS. in sched., sp. nov. (Tab. 508, fig. 11.) Robustum, *elatum*, ad 5 cm. altum; caulis pluries divisus, fragilis. Folia inferne breviora, laxa, ad apices ramulorum *comata*, elongata, conferta; caulina *e basi erecta appressa vaginante abrupte reflexa*, *patula*; comalia longiora, minus patentia, ad 2·5 mm. longa, siccitate incurva; e basi breviter ovali sensim acutata, plus minusve acute acuminata, carinato-concava, marginibus planis vel supra basin leniter anguste reflexis; costa angusta, dorso lævis, vix percurrens. Areolatio *pellucida*, lævis, superne e cellulis *juxta costam elongatis*, elliptico-rhomboideis vel anguste rectangularibus ad 35 μ longis, *versus marginem brevioribus* irregulariter subquadratis, parietibus firmis, tenuibus vel incrassatis instructa; ad basin e cellulis *laxioribus*, irregularibus, hexagono-rectangularibus vel omnino rectangularibus inanibus pellucidis composita. Seta circa 1 cm. alta, gracilis; theca parva, *sat anguste elliptica*, (ætate) nigricans, pachyderma. Cetera ignota.

Hab. Khegumpa, Bhotan, 6500 ft.; leg. Griffith, no. 17 (in herb. W. Mitten), c. fr.

The leaves, abruptly reflexed from an appressed, sheathing base separate this species at once from the allied plants. The comal leaves, both at the apex of the stems and branches, and at the points on the stems at which the perichætia and the innovations are produced, give the interrupted appearance to which the plant owes its specific name. I have not, however, seen any comal tuft formed except at a point which is, or at one time has been, the termination of a stem or branch; whereas in the previous species the leaves are comose at regular or irregular intervals along the stems, which are therefore more truly "annotinous" than in the present plant.

Timmiella anomala (B. & S.) Limpr. Binsar, 7000 ft., Almora, 1910; leg. Miss E. Shepheard (no. 20), c. fr.

Hyophila subflaccida Broth. & Dixon, sp. nov. (Tab. 507, fig. 3.) Dioica. Humilis, sat dense cæspitosa, saturate viridis, inferne rufescens, *mollis*. Caulis vix ·5 cm. altus, simplex; folia inferiora pauca, remota, parva, superiora *in comam rosulatam aggregata*, *patula*, siccitate valde convoluta, incurvo-contorta, nec crispata; e basi angustiore obovata vel subspathulata, 2–2·5 mm. longa, 1 mm. lata, apice paullo recurva, *acuta breviter apiculata*; margine plano, versus apicem *irregulariter acute denticulato*. Costa infra crassa, versus apicem angustata, in mucronem brevem acutum excurrens. Areolatio superne *semi-opaca*, *haud obscura*, hexagono-rotunda, parum incrassata, 6–8 μ lata, chlorophyllosa, *minutissime papillosa*, versus basin laxior, pellucida, rectangularis, ad infimam basin elongata, hyalina. Perichætii bracteæ internæ *acutæ*, e cellulis rhomboideis instructæ. Seta 1 cm. longa, inferne rubra, superne straminea; theca *parva*, *cylindrica*, *collo breviusculo*, *recta nec curvata*, deoperculata, 1–1·5 mm. longa, operculo dimidiam partem æquante. Annulus latiusculus, solubilis, interdum persistens. Peristomium nullum. Spori 8–10 μ.

Hab. Lucknow, Oudh, India borealis, on brick walls, 17 Oct. 1904; leg. W. Gollan (Bryoth. E. Lev. no. 6377), c. fr. Andheri, near Bombay, on a wall, Nov. 1908; leg. Lt.-Col. K. R. Kirtikar (no. 74), c. fr.

Differs from the allied *H. cylindrica* (Hook.), *H. perannulata* Ren. & Card., and *H. stenocarpa* Ren. & Card., in the shorter, not curved capsule; from *H. javanica* Brid. in the short neck of the capsule and other points. *H. Micholitzii* Broth. and *H. Dozy-Molkenbœri* Fleisch. are larger plants with broader, more obtuse leaves and obtuse perichætial bracts. *H. apiculata* Fleisch. has the leaves erect and cylindrically convolute, not spreading, but otherwise appears to be near our plant.

Didymodon Wallichii (Mitt.) Broth. Binsar, Almora, 1910; leg. Miss Shepheard (no. 16), c. fr.—*D. recurvus* (Mitt.) Broth. Binsar, Almora, 1910; leg. Miss Shepheard (no. 21), st.—*D. rufescens* (Hook.) Broth. Stones, Fort Purandhar, Poona District, May, 1910; leg. Sedgwick (no. 83*a*), st. This species has, I believe, not been recorded hitherto from anywhere but Northern India. I have compared it with specimens from Sikkim, distributed by Miss Roberts (*Himalayan Mosses*, ii., No. 4), determined by Brotherus, and it agrees entirely, except in the somewhat smaller size.

Grimmia anodon B. & S. Mahshookee, India; leg. Griffith (unnamed in Mitten's herb., sub num. 90), c. fr.—*G. crinita* Brid. "Rondu, Indus Valley," and "India," unnamed in Mitten's herbarium (sub num. 5 and 6), c. fr. These two plants are identical, and scarcely differ from *G. crinita*, except that the seta is rather longer, so that the capsule is more conspicuously exserted. *G. sinaica* B. & S. (Mt. Sinai; leg. Schimper, 1836, in herb. Schimp. at Kew) appears to be the same thing. I have not examined the peristome, for which the authors of the Bry. Eur. describe some characters slightly differentiating *G. sinaica* from *G. crinita*, but apart from that I can see no difference beyond the slight elevation of the capsule, a feature which I have seen approached on European specimens of *G. crinita*. —*G. elongata* Kaulf., East Nepal, India, 14,500 ft. (unnamed in Mitten's herbarium, sub num. 4), st. I think this is certainly referable to *G. elongata*.—*G. trichophylla* Grev. Manipur, India; leg. G. Watt (unnamed in Mitten's herb.). Two specimens with identical labelling certainly belong to this species, which appears not to have been hitherto recorded from India.

Explanation of Plates.

Tab. 507.—Fig. 1. *Fissidens Sedgwickii*. 1*a*, leaf × 20. 1*b*, upper cells × 200. 1*c*, basal cells of vaginant lamina × 200. 1*d*, stem, lower half moist, upper half dry, × 1½. 1*e*, transverse section of leaf at upper part of vaginant lamina, × 125.

Fig. 2. *Calymperes tortelloides*. 2*a*, *a'*, leaves × 20. 2*b*, upper cells × 200. 2*c*, basal cells × 125. 2*d*, upper part of stem, dry, with capsule, × 5.

Fig. 3. *Hyophila subflaccida* (leg. Gollan, no. 6377). 3*a*, leaf × 20. 3*b*, upper, 3*c*, basal cells × 200. 3*d*, capsule × 20. 3*e*, exothecium cells × 100.

Tab. 508.—Fig. 4. *Merceyopsis minuta* (Mussoorie, 1895; leg. Duthie). 4*a*, leaf × 20. 4*b*, upper cells × 200.

Fig. 5.—*M. angustifolia*. 5*a*, *a'*, leaves × 20. 5*b*, upper, 5*c* basal cells, × 200. 5*d*, capsule × 20. 5*e*, exothecium cells × 80.

Fig. 6.—*M. hymenostylioides*. 6*a*, leaf × 20. 6*b*, upper cells × 200.

Fig. 7.—*M. sikkimensis* (Bryoth. E. Levier, 1699). 7*a*, leaf × 20. 7*b*, upper cells × 200.

Fig. 8.—*M. angulosa*. 8*a*, leaf × 20. 8*b*, upper cells × 200. 8*c*, part of leaf in transverse section × 200. 8*d*, capsule × 20. 8*e*, rib of capsule × 200.

Fig. 9.—*M. pellucida*. 9*a*, leaf × 20. 9*b*, upper cells × 200. 9*c*, nerve section × 200.

Fig. 10.—*Hymenostylium Shepheardæ*. 10*a*, leaf × 20. 10*b*, upper, 10*c*, basal cells, × 200.

Fig. 11.—*H. annotinum*. 11*a*, leaf × 20. 11*b*, upper cells × 200. 11*c*, stem × 2.

Fig. 12.—*Fissidens crenulatus* (leg. Sedgwick, no. 60). 12*a*, leaf × 20. 12*b*, upper cells × 200.

Fig. 13.—*Campylopus Sedgwickii* (leg. Sedgwick, no. 56). 13*a*, leaf × 12. 13*b*, upper cells × 150. 13*c*, supra-basal cells × 150.

COLLODERMA, A NEW GENUS OF MYCETOZOA.

By G. Lister, F.L.S.

The late Christian Lippert has described and figured, under the name of *Didymium oculatum*,* a curious species belonging to the Mycetozoa that appeared in the winter of 1892–3 on old fir-wood kept moist in a cultivating chamber. This wood he had obtained a few months previously from near Hallstatt, in Upper Austria.

The following is a free translation of his description :—

Didymium oculatum, nov. spec. Sporangia solitary, spherical, depressed, ¾ to 1 mm. diam., seated on a thick brown columnar hypothallus whose upper part consists of a felted mass in which the sporangium is embedded. Sporangium-wall single, hyaline, firm, showing unusual resistance, and having scattered deposits of extremely minute lime-granules. Capillitium much branched and anastomosing, arising from the base of the sporangium, 2 to 4 μ diam., or 6 to 7 μ at the axils of the branches, terminating above at the sporangium-walls in very slender forked and branching free ends. Capillitium threads hyaline at the base, brown above. Columella none. Spores spherical, violet-brown, spinulose, 12 to 13 μ diam.

The sporangia were at first dirty white, then yellow, and finally dark brown or violet-black.

Lippert further states "the spores appear to be held together by a mucilaginous mass."

Thanks to the courtesy of Prof. von Höhnel, I have seen glycerine preparations of Lippert's specimen. They show several

---

* "Ueber zwei neue Myxomyceten," Verhandl. der k. k. zool. bot. Gesellsch. Band xliv. p. 72, Tafel iv. (1894).

remarkable features. The "eye-like" appearance of the sporangium, which suggested to Lippert the specific name *oculatum*, is seen only when the sporangium is moist and unbroken. The effect is produced by the dark mass of spores enclosed by a membranous sporangium-wall being surrounded by a thick, hyaline, gelatinous layer, and this again, in the lower part especially, by a deposit of yellowish granular refuse matter, which is more or less penetrated by fungus hyphæ, forming the "felted yellow mass" of Lippert's description. He was not quite correct in thinking that the spores are held together by a gelatinous mass, for the latter is outside the membranous wall. The lime-granules he refers to are no longer visible in these preparations, but they may have dissolved in the mounting medium. Some of the threads of the capillitium exhibit a peculiar structure. They consist of a hyaline sheath enclosing a darker axis; this sheath is often interrupted and forms long or short bead-like segments. Other threads have the usual homogeneous appearance.

A further gathering of *D. oculatum* has recently been made by the Rev. W. Cran. He discovered last September about twenty of the minute sporangia on moss and hepatics on dead wood, in two localities about four miles apart, near Skene, Aberdeenshire. The specimens, which he has kindly sent me for identification, throw fresh light on this interesting species. The inconspicuous olive or purple-brown sporangia are either solitary or grouped in small clusters, subglobose or elongated to form short plasmodiocarps; in one case two sporangia are mounted together on a short black stalk, otherwise they are all sessile. In a dry state the sporangium-wall is brittle, and dehisces irregularly, exposing the purple-brown mass of spores and colourless tips of the capillitium. When a sporangium is placed in water the gelatinous outer layer rapidly swells to form a thick coat, completely surrounding the membranous wall with its enclosed mass of spores. Glycerine preparations show that the sporangium-wall, the capillitium with the interrupted sheath of the threads, and the spores are similar in all respects to those of Lippert's type; the superficial granular deposits are, however, free from fungus hyphæ. There is no trace of lime in the sporangium-wall.

Lippert described the capillitium as arising from a peripheral ring of the floor of the sporangium, and surrounding a central space free from both spores and capillitium. This is not the arrangement in the Scotch specimens. In those sporangia in which the upper part of the wall has fallen away and the spores are dispersed the capillitium is seen to arise from the central part only of the flat membranous floor, while the outer part of the floor appears as a bare, glossy, ring-shaped area; the attachment of the capillitium would seem, therefore, to vary in different gatherings.

From the small amount of material we possess, we are hardly in a position at present to judge of the true affinities of this remarkable species. If Lippert's observations should prove to have been correct, and lime-granules are occasionally present in

the sporangium-walls, it should be placed in the *Physaraceæ*. It cannot belong to *Didymiaceæ*, for in that Order the deposits of lime are in the form of crystals. From the general structure of the capillitium threads it appears to be nearly allied to *Chondrioderma* Rost. (syn. *Diderma* Pers.). The gelatinous outer sporangium-wall is different, however, from anything we see in *Chondrioderma*, and affords so singular a character that the species may well be placed in a new genus. The name *Colloderma* is chosen in reference to this gelatinous wall.

In the light of Mr. Cran's gatherings the genus and species may be described as under:—

Colloderma, nov. gen. Sporangia subglobose; sporangium-wall of two layers, the outer gelatinous, with superficial deposits of granular refuse-matter, and with perhaps sometimes additional deposits of minute lime-granules; inner layer membranous; capillitium a network of branching and anastomosing purplish threads, without lime-knots; spores brownish-purple.

C. oculatum (Lippert) G. Lister. Plasmodium? Sporangia subglobose, 0·5 to 0·7 mm. diam. when dry, 0·8 to 1 mm. diam. when wet, sessile, sometimes forming short straight or curved plasmodiocarps, rarely stalked, scattered or grouped in small clusters, glossy, olive-brown or purplish-brown, often seated on a purple-brown membranous hypothallus; outer layer of sporangium-wall, when moist, thick, hyaline, gelatinous, clothed externally with yellowish-olive granular refuse-matter, inner layer membranous, firm. Stalk, when present, stout, dark brown. Capillitium a network of pale or dark purplish-brown threads attached above and below to the sporangium-wall, colourless at the extremities, arising from the flat base of the sporangium, 2 to 4 μ diam. below, more slender and closely branched above. Spores brownish-purple, spinulose, 11 to 13 μ diam.

NOTES ON DARTMOOR BORDER RUBI.

By Rev. W. Moyle Rogers, F.L.S.

These notes are mainly due to my observations during three summer visits to Dartmoor in recent years: the first in 1904 to Hey Tor, in the north-east; the second to the Okehampton and Belstone neighbourhood, in the north-west, in 1908; and the third in 1910, to the west and south-west, from Okehampton to Shaugh Bridge and Bickleigh towards Plymouth. Some account of the Rubi seen by me in the course of the two earlier of these visits appeared in this Journal at the time. But the third seems to me the most fruitful in interesting results; and, while I am recording them, it may perhaps be of interest to other students of the genus if I use the opportunity for a review of the particulars that have accumulated on the subject since the publication of Mr. T. R. Archer Briggs's *Flora of Plymouth* in 1880.

I cannot, of course, pretend to give an exhaustive account of the Rubi to be found on Dartmoor and its very extensive outskirts. But I have tried to "sample" the prevailing bramble bushes on all sides of the moor, and have made my way up several of its tors. In my last visit I also had no inconsiderable help from my son ("F. A. R.") and my daughter ("M. A. R."), who were able to bring me fresh specimens from localities beyond my reach.

Fairly numerous references will also be found to specimens collected on the borders of Dartmoor by several other botanists, and especially by Mr. Briggs; as also to some previous records of my own which appeared in this Journal in 1882. But I have thought it best to exclude from this paper all records of comparatively early date, except where I have been able to satisfy myself of their accuracy by an examination of fairly representative specimens.

It is perhaps a sufficient explanation of the order in which the localities are given to state that their range is from Great Haldon and Hey Tor at the north-east end of the moor, westward along and above the Teign Valley, by Moreton-Hampstead, Chagford, and South Tawton to Belstone and Okehampton; and thence southward, along the high ground skirting the London and South Western and the Great Western Railways to the neighbourhood of Plymouth; with, at the end of the series, a few places north of Plymouth, towards Ashburton and Hey Tor. Most of this ground belongs to the Watsonian vice-county 3 (S. Devon); only a small portion of it, on the west, extending across the border into N. Devon (v.-c. 4), in the Okehampton and Bridestowe neighbourhoods. It has seemed most convenient to put all the S. Devon localities together after the figure "3," leaving the rest to follow after the figure "4." An asterisk is attached to the *figure* for such forms as are considered to be "new records" for the vice-county.

As regards height above sea-level, very few localities are given—and those almost exclusively from the Teign Valley and the immediate neighbourhood of Plymouth—below 400 ft., while the great majority range from 600 to 1100 ft. Of those on the moorland near Hey Tor and towards Princetown a fair number apparently exceed 1100 ft.; while the average height for all may be between 600 and 700 ft.*

Rubus idæus Linn. Frequent, and often undoubtedly native, up to at least 1000 ft. above sea-level.

Suberecti.

Decidedly uncommon, and often uncharacteristic.

R. fissus Lindl. Rare. 3. Heath between Mary Tavy and

---

* Readers of this Journal who are especially interested in the distribution of our British Rubi I may here be allowed to refer for comparison to two previous papers of mine, those "On Some Scottish Rubi" in the 1897 volume, pp. 42–50, and "Rubi of the Neighbourhood of London," 1903, pp. 87–97. The contrast between the prevailing forms of Scotland and Dartmoor respectively seems to me of especial interest.

Lamerton (no panicle), *F. A. R.*; near Horrabridge, *Briggs* (1879) and *F. A. R.*, 1910.

R. suberectus Anders. Certainly uncommon. 3. Doddiscombsleigh, *Briggs*; Bickleigh Vale, *Briggs* and *Focke*. 4. By R. Taw at Sticklepath; near the foot of the Lydford Waterfall. Very luxuriant in both places.

R. Rogersii Linton. 3. Moreton-Hampstead, marshy hillside, 1881. Its first known locality, and the only place in the county where it has yet been found.

R. sulcatus Vest. 3. Haldon Hill, *Briggs*. Abnormally small, but otherwise characteristic. The only other Devon locality known is "by Thornbury and Holsworthy Road" (at the other end of the county), whence Mr. Briggs brought me specimens in 1885.

R. plicatus Wh. & N. Apparently quite local. 3. Near Moreton-Hampstead; Nitton Heath. Chagford, *Briggs*. Roborough Down, near Yelverton. 4. Okehampton. In this instance an incomplete list of localities no doubt.—Var. *Bertramii* G. Braun. *3. Hollow above Horrabridge, on Roborough Down, in several spots; a very tall prickly and nearly glabrous form, *F. A. R.*—Var. *hemistemon* (? Genev.), *pseudo-hemistemon* Focke. 3. Below Hanger Down, near Harford, 1880, *Briggs* (specimen in the British Museum!).

Subrhamnifolii.

Except *opacus* and *Briggsianus*, very rare.

R. nitidus Wh. & N. var. *opacus* Focke. 3. Black Lea, Trusham; near London and South Western Railway station, Lydford, *F. A. R.*; Bickleigh Vale; Egg Buckland Parish, frequent. 4. Near S. Tawton, Sticklepath, and Okehampton. Usually a small form distinguished as "f. *minor*" by Focke (Journ. Bot. 1890, pp. 100, 101).

R. affinis Wh. & N. 3. Border of Milber Down, *Briggs*; Heathfield, Newton Abbot, *S. T. Dunn*; Mary Tavy, by R. Burn; small and uncharacteristic. Mary Tavy to Lamerton, *F. A. R.* 4. South Tawton, by R. Taw. Henbury, Buckland Brewer, *H. A. Evans*. The only Devon localities known to me.—Var. *Briggsianus* Rogers ("*R. affinis* W. & N.," Fl. Plym.). 3. Locally abundant on the hills above Teign Valley at Ashton, Trusham, Knighton Heath, North Bovey, Moreton-Hampstead, &c.; moorland below Hey Tor; Christow and Canonteign Downs; near Chagford; near Riverhead, Bickleigh and The Combe, Egg Buckland. 4. Sticklepath; Belstone; Okehampton. Apparently the most widely distributed and abundant subrhamnifolian in Devon.

R. cariensis Genev. *3. Base of Tor Hill, Lydford, 1910. 4. Okehampton Hill, in plenty, 1908. First seen as a British plant at Lynton by me in 1881, this very conspicuous bramble has proved to be fairly frequent in different parts of N. Devon—as in many of our western counties up to Carnarvon. It will probably be found elsewhere along the edge of the moor.

Rhamnifolii.

Exclusive of the three very common species *R. argenteus*, *R. dumnoniensis*, and *R. pulcherrimus*, this group seems less strongly represented on Dartmoor and its borders than in most English districts of like extent.

R. imbricatus Hort. 3. Frequent on the lower ground in the Teign Valley and in the neighbourhood of Plymouth, this plant becomes scarce on higher levels; near Roborough Down, not far from the Rock; Meavy Valley, near Yelverton, in one place. Near Tavistock, *Briggs*. 4. S. Tawton, Sticklepath, and Okehampton, frequent.

R. carpinifolius Wh. & N. Certainly uncommon; if not, as I think, quite rare. 3. Lustleigh Cleave. Egg Buckland, *Briggs*, *Hanbury*.

R. incurvatus Bab. Locally in fair quantity. Unquestionably a good form of this aggregate species as I understand it, though not exactly identical with the Welsh type. *3. Yennadon Down, near the reservoir; Roborough Down, between Yelverton and Horrabridge, 1910. 4. N. Tawton, *Hiern*; S. Tawton; S. Zeal; Sticklepath; Belstone.

R. Lindleianus Lees. Widely but rather thinly distributed. 3. Near Hey Tor; through the Teign Valley and on the higher ground around, fairly frequent; Moreton-Hampstead and Chagford; Lydford; Brent Tor; Blackdown (hamlet); Egg Buckland and elsewhere near Plymouth. 4. Okehampton neighbourhood, frequent.

R. argenteus Wh. & N. (*R. erythrinus* Genev. prius). So far as I have been able to observe, this is the most generally distributed and most abundant bramble throughout the districts with which this paper is specially concerned. Separate localities, of which I have a long list, are therefore omitted here; near Hey Tor and on Brent Tor it occurs at about 1100 ft. above sea-level; and on the western side of the moor it reaches some of the barer spots on Black Down, Yennadon Down, and elsewhere towards Princetown.

R. rhamnifolius Wh. & N. The usual British form. Very unequally distributed; uncommon, except on comparatively low ground. 3. Moorland below Hey Tor; Teign Valley, common; Lydford, rare; near Mary Tavy; Roborough Down, near Yelverton. Lamerton, *F. A. R.*; Egg Buckland and neighbourhood, frequent. 4. S. Tawton; Belstone; and near Okehampton, in no great quantity.

R. dumnoniensis Bab. (*R. incurvatus* Bab., Fl. Plym.). Very common. 3. Up to about 1100 ft. near Hey Tor and on Brent Tor; and one of the five or six most conspicuous brambles everywhere along the western border, reaching the Princetown neighbourhood beyond Dousland and Yennadon Down; Egg Buckland neighbourhood, frequent. 4. S. Tawton; S. Zeal; Belstone and Okehampton.

R. pulcherrimus Newm. As generally distributed as the last, and apparently quite as hardy. It seems unnecessary to quote

from my long list of localities for both, as the places all round the moor where they do not occur are certainly very few. Formerly known chiefly as *R. umbrosus* Arrh., a name which, as then used, included other species.

Villicaules.

All uncommon, or distinctly local.

R. mercicus Bagnall. *3. Between Dousland and Princetown, *F. A. R.* I cannot distinguish this Dartmoor plant from Mr. Bagnall's type, as represented by several of his sheets in my herbarium, though the more advanced panicles in them have their lower branches considerably longer. There is no record for any other county south of Hereford.

R. villicaulis Koehl. 3. Ilsington Road, below the "Moorland Hotel," Hey Tor, 1904. This seems identical with the Silesian plant originally thus named by Koehler, though I know no other Devon locality for it. The *R. villicaulis* of Fl. Plym. consists partly of a nearly allied form like that usual in North-west Germany, and partly of *R. pyramidalis* Kalt. On *R. villicaulis* and its closest allies reference may be made to Journ. Bot. 1897, 45, 46.

R. Selmeri Lindeb. Remarkably local. I failed in my search for this in 1910, and I have no S. Devon specimen of it now, but I believe that it occurs in some quantity in the Teign Valley and in the Plymouth neighbourhood. 4. Belstone and Okehampton neighbourhood, fairly frequent, 1908. Though this is one of our most widely distributed and locally abundant British brambles, it is on gravel and well-drained sandy soils that it is chiefly found.

R. rhombifolius Weihe. Rare or local. *3. By R. Burn, near Mary Tavy railway station; Longcross, near Milton Abbot. Brent Tor to Coryton, *M. A. R.* *4. Near Bridestowe. In both vice-counties seen for the first time in 1910.

R. gratus Focke. 3. Weston Mills, near Plymouth, *Hanbury*. The only Devon locality known to me.

R. leucandrus Focke (*R. hirtifolius* Müll. & Wirtg., Fl. Plym.). 3. Blunt's Hill; Coleridge; Derriford: all in the parish of Egg Buckland. This must, I believe, be considered an exceptionally hairy form of the plant so abundant in the Bournemouth neighbourhood, which was named *leucandrus* by Focke himself when he saw it growing there in 1889 and 1894. In 1897 the late Mr. Gelert came to the same conclusion.

Discolores.

More local and in smaller quantity generally than in most British districts of equal extent.

R. ramosus Briggs. Rather thinly distributed, but locally abundant. 3. Moorland near Hey Tor; near Moreton-Hampstead and elsewhere on the hills above Teign Valley towards Haldon, but in considerable quantity only on Black Lea, Trusham. Near Tavistock and Bickleigh, *Briggs*; Egg Buckland and elsewhere near Plymouth, frequent. Some of the bushes occurring near Plymouth are off type and come very near to *R. macrostemon* Focke.

R. thyrsoideus Wimm. Very rare. 3. Tamerton Folliot, near Roborough Down, but on a much lower level by the mouth of the Tavy, *Briggs*. "Really our German plant," Focke, 1872. 4. Okehampton Park by R. Okement, 1908; a small form very near to the Continental segregate, *R. candicans* Weihe.

R. Godroni Lec. & Lam. Uncommon or rare. 3. Hey Tor Down and Liverton, 1904; Roborough Down, in several spots between Yelverton and Horrabridge, a very handsome form. Though now established in that part of the down as a well-marked constant plant, this looks as if it might originally have arisen from a crossing between *R. Godroni* and *R. leucostachys* Sm. 4. S. Tawton; White Rock Hill, Sticklepath; Belstone.

R. robustus P. J. Muell. 3. Remarkably abundant and far the most conspicuous Discolorean along the western border from Kit's Steps, Lydford, by Black Down, Mary Tavy, Roborough Down, to Bickleigh Vale; Liddaton Green; Longcross, near Milton Abbot. Mary Tavy to Brent Tor (about 1100 ft.) and thence to the N. Devon border at Coryton, *M. A. R.* *4. Near Bridestowe. Not observed by me in the county until 1910, though two or three years ago I suggested the name for a plant collected by Mr. G. B. Savery between Yellowford and Brampton Speke (3). Its exact position and rank in our list is provisional only. It seems as nearly allied to *R. pubescens* and *R. macrostemon* as to *R. Godroni*, and in Dr. Focke's *Mitteleurop. Rubi* (1902) † the name appears as a synonym of his *R. macrostemon*.

R. rusticanus Merc. Only locally abundant, and apparently altogether absent from considerable districts on the western border. 3. Moorland, Hey Tor; Teign Valley, common. Brent Tor to Coryton, *M. A. R.*; Roborough Down; Walkhampton; near Dousland, weak and infrequent; Bickleigh and Egg Buckland neighbourhood, common. 4. Okehampton neighbourhood, frequent. The comparative scarceness of this plant on Dartmoor, as in Scotland, is worthy of remark as suggesting exceptional sensitiveness to climatic conditions.

Silvatici.

Fairly well represented.

R. silvaticus Wh. & N. Locally abundant; variable, especially in exposed situations. 3. Canonteign Down; Lustleigh. Bovey Tracy and neighbourhood, *Briggs*; Kit's Steps, Lydford; Mary Tavy; Roborough Down, near Yelverton. 4. Sticklepath and Belstone.

R. lentiginosus Lees. Rare. 3. Yealm Vale; Bottle Hill, *Briggs* ("var. *devoniensis*" Focke). 4. S. Tawton, by the Taw near Sticklepath, 1908.

R. macrophyllus Wh. & N. Apparently uncommon; but the distribution is still only partially known owing to the confusion which so long existed between the type and allied plants now

† Ausschnitt aus P. Ascherson und P. Graebner: *Synopsis der Mitteleuropäischen Flora.*

distinguished from it. 3. Lydford, between railway station and village; by R. Burn, Mary Tavy. 4. Belstone; Bridestowe, a very luxuriant form in damp thickets. — Var. *Schlechtendalii* (Weihe). One of the more common and constant Devon Rubi. Readily recognized, though usually more densely hairy than in most other counties. 3. Generally distributed and often abundant along the western border from Lydford to Bickleigh; on that side of the moor I saw it last summer in at least a dozen distinct localities, and traced it beyond Dousland towards Princetown, and up to nearly 1100 ft. above sea-level on Brent Tor. Near Lee Bridge, Chagford, *Dunn*; Knackersknowle and Porsham; Ivybridge to Harford, *Briggs*. 4. S. Tawton; S. Zeal; Sticklepath; Belstone; Okehampton.—Var. *macrophylloides* (Genev.). 3. Egg Buckland, a very glandular and hairy form. The only other Devon locality from which I have seen a specimen is "Bradninch to Criss Cross, Silverton," *G. B. Savery*.—Var. *amplificatus* (Lees). *3. Near Yeoford railway junction, 1910, *F. A. R.* The only Devon locality known.

Vestiti.

One of the more common Dartmoor groups, though in some districts mainly represented by two or three forms.

R. Sprengelii Weihe. Singularly local, though usually abundant where it occurs. 3. Hey Tor Down; Haldon, near the racecourse; Nitton Cleave. Near Sheep's Tor, *Briggs*. Not seen by me at all in 1910 between Lydford and Bickleigh over many miles of Downs. 4. N. Tawton, &c., *Hiern*; Belstone and Okehampton, frequent.

R. hypoleucus Lefv. & Muell. Common. 3. Especially abundant on the north-east border on all the higher ground above Teign Valley towards Hey Tor and Haldon; also along the west border from Lydford to Bickleigh and up to over 1000 ft. on Brent Tor. Dousland towards Princetown; Brent Tor to Milton Abbot; Mary Tavy to Brentor, *M. A. R.*; Lamerton, *F. A. R.* 4. Near Okehampton.

R. hirtifolius Muell. & Wirtg. var. *mollissimus* Rogers. 3. Lydford; north-west border of Black Down, by rocky stream and wood, in great abundance and very luxuriant; also on the Tor Hill near the railway station. 4. S. Zeal; by the Taw at Sticklepath.

R. iricus Rogers. *3. Very common throughout the large parishes of Lydford and Brent Tor, and southwards to Bickleigh; up to at least 1000 ft. on Brent Tor; Liddaton Green, very fine; near Milton Abbot. Mary Tavy to Brent Tor and Coryton, *M. A. R.*; by R. Burn, near Mary Tavy railway station; Roborough Down; near Walkhampton; Yennadon Down; near Dousland; Shaugh Bridge to Bickleigh. *4. Bridestowe. Usually less robust than the Irish type, though, like it, attracting attention at once by its very showy large-flowered panicles. The occurrence of this conspicuous bramble in such profusion along the whole western border of the moor (though it is absent, so far as I have observed, from the rest of the county) came as a great surprise to me last summer. The circumstance that it here grows mostly at a considerable

height above sea-level (from 300 to over 1000 ft.), and along hedge-banks in deep lanes and field borders, where the bushes are frequently cut back in the summer, may account for its divergence in some minor details from the still more luxuriant Irish type. But I have found it impossible to detect any very marked difference between the average Devon plant and some sheets of small S. Kerry and W. Mayo *iricus* sent to me by Messrs. Marshall and Scully to illustrate the range of variation in the species as observed by them in Ireland. The Devon and S. Kerry plants have narrower and less straggling panicles than the type, and the Devon plant a more densely hairy stem and darker, narrower and more deeply incised leaflets; but in all alike, as also in other English bushes, we find (though in varying degree) the truncate-pyramidal ultra-axillary panicle, with stout, closely placed, patent branches, large deep pink petals and scanty needle-like prickles of *iricus*, as distinguished from the lax cylindrical panicle with slender and somewhat patent-erect branches, smaller pale petals, and numerous short, strongly curved prickles characteristic of the allied *R. hirtifolius*. In outline of panicle and its acicular prickles my *mollissimus* comes nearer to *iricus* than type *hirtifolius* does; but it is unlike both in its roundish petals and roundish-oval, cuspidate leaflets, features which give a totally different appearance to the living bushes as they grow within a few hundred yards of each other at Lydford. The distribution of *R. iricus* in England, as at present known, is wholly western, from W. Cornwall to Carmarthen.

R. pyramidalis Kalt. (*R. villicaulis* Koehl. Fl. Plym. in part). Frequent, and perhaps generally distributed, though rather thinly in most districts. 3. Moorland, Hey Tor, and on most of the higher ground above Teign Valley to Moreton-Hampstead, rather variable; Kit's Steps, Lydford, and thence to Brent Tor; Roborough Down; Yennadon Down. 4. S. Tawton and Okehampton neighbourhood, common; Bridestowe.

R. pyramidalis × *rusticanus* (apparently). 3. Liddaton Green.

R. leucostachys Sm. Frequent, but rather local. 3. Near Hey Tor and elsewhere in the north-east; Lydford; Brent Tor; Mary Tavy; Whitchurch Down; Roborough Down; Meavy Valley; Bickleigh and Egg Buckland, common. 4. S. Tawton and Okehampton, common; Bridestowe. — Var. *gymnostachys* (Genev.). 4. S. Zeal, 1908; the only Devon locality that I know, except "near Silverton," *G. B. Savery*, 1906. —*R. leucanthemus* P. J. Muell.? 3. Near Fancy, Egg Buckland; my only locality for the county.

R. lasioclados Focke var. *angustifolius* Rogers. Fairly frequent. 3. Hey Tor Down; Black Down; Roborough Down; Shaugh Bridge; Bickleigh. 4. "Near Tawton," *Hiern*.

Egregii.

Not common, but several species fairly well represented.

R. Borœanus Genev. 3. Bickleigh, *Briggs*; Egg Buckland neighbourhood, in several localities and strongly marked.

R. mucronatus Blox. Thinly scattered, and usually more or less uncharacteristic. 3. Hey Tor Vale, in plenty, a strong and nearly glabrous but highly glandular form; Roborough Down, between Yelverton and Horrabridge, a singular 3-nate-leaved form. Near Milton Abbot and near Dousland, *F. A. R.* I know of only one N. Devon locality, Huntshaw Moor, *Evans*.

R. anglosaxonicus Gelert. Rare. 3. Longcross, near Milton Abbot. Plympton St. Mary, *Briggs*. The only N. Devon locality where I have seen the type is Bridgerule, on the Upper Tamar, at a considerable distance from the moor.—Var. *curvidens* Ley. Locally abundant and very luxuriant. 3. Lydford, wood-border along the Great Western Railway line, *F. A. R.*; Longcross, in immense clumps in roadside ditches. Heath between Mary Tavy and Lamerton, *F. A. R.* 4. Quarry near Okehampton; Bridestowe, in two places. Except for the uniformly narrower and more nearly parallel-sided leaflets (taking the variety one step nearer to type), the Devon plant is practically identical with extreme highly glandular examples of Mr. Ley's plant as found in Wales and along the Welsh border by him and the late Rev. W. R. Linton.

R. uncinatus P. J. Muell. 4. Okehampton; hill by railway station, 1908; the only Devon locality known.

R. Borreri Bell Salt; rather uncommon. 3. Hey Tor Down; Brent Tor to Milton Abbot; on Roborough Rock and (sparingly) elsewhere on Roborough Down. 4. Sticklepath to Belstone, in fair quantity; Okehampton, hill near railway station; Bridestowe.—Var. *dentatifolius* Briggs; one of the four or five most common brambles. 3. Moorland; Hey Tor; Teign Valley to Chagford. Gidleigh, *Briggs*; Lydford to Bickleigh, frequent; Egg Buckland and neighbourhood. 4. S. Tawton; Sticklepath; Belstone; Okehampton.

R. Drejeri G. Jensen. Apparently rare. Near Tavistock, *F. A. R.*; Roborough Down near Horrabridge.—Var. *Leyanus* Rogers. 3. Egg Buckland, in some quantity, 1893. I have seen this from several other Devon localities, but all of them at a distance from the moor.

Radulæ.

With the single exception of *R. anglicanus*, very local.

R. radula Weihe. 3. "Between Beer Ferrars and Moorwhellam," in the peninsula between the mouths of the Tamar and Tavy, and so rather far from the actual border of Dartmoor, *Briggs*, specimen in British Museum! The only example of the type that I have seen from the county.—Var. *anglicanus* Rogers (*R. radula* Weihe, Fl. Plym.). Widely distributed and locally abundant. 3. Teign Valley and hills around, from Kingsteignton to Knighton Heath and Chagford, frequent. Between Gidleigh and Chagford; Fernworthy, &c., *Briggs*; Kit's Steps, Lydford; Roborough Down, near Horrabridge, *F. A. R.* Bickleigh to Egg Buckland, *Briggs*. 4. S. Tawton and Belstone. Quite characteristic and always distinct from type *radula* and from the

R. ericetorum of our list; occupying an intermediate position between them.

R. echinatus Lindl. (*R. rudis* Weihe, Fl. Plym.). Very local. 3. Knighton Heath. Honicknowle, *Briggs*. 4. Though this occurs at Westward Ho! and is frequent by the Tamar between Bridgerule and Holsworthy, I have no N. Devon locality for it near Dartmoor.

R. oigocladus Muell. & Lefv. Local and variable. 3. Lydford, north-west end of Black Down; between Brent Tor and the Tor. Yeoford Junction, near Horrabridge, *F. A. R.*; Bickleigh Vale; Egg Buckland and elsewhere near Plymouth, fairly frequent. 4. White Rock Hill, Sticklepath. — Var. *Newbouldii* Rogers. Locally abundant. *3. From Kit's Steps, Lydford, by Black Down, &c., to Roborough Down; near Dousland. *4. Bridestowe.

Sub-Koehleriani.

R. melanodermis Focke? Very rare. I have never seen the living plant in Devon; but, after he had studied it in the Bournemouth neighbourhood, Mr. Briggs and I were agreed in thinking that specimens of his collecting at Shalaford and near Forder Bridge, near Plymouth, should probably be so named. I cannot, however, vouch for their absolute identity.

R. Babingtonii Bell Salt., f. *umbrosa*. *3. Near Walkhampton, in a deep lane near the village, 1910. The only Devon locality yet known.

R. mutabilis Genev., var. *memorosus* Genev. 3. Locally abundant; Roborough Down; Yennadon Down, near the Reservoir; Shaugh Bridge to Bickleigh; Egg Buckland and elsewhere near Plymouth. This very strongly marked "variety" is, so far as at present known, endemic, and found only in S. Devon. For detailed description of further localities see Fl. Plym. It keeps very distinct from the type and from Mr. White's var. *Naldretti*.

Sub-Bellardiani.

Fairly well represented, though mostly local.

R. fuscus Wh. & N. Untypical. 3. Whitleigh Wood and Tamerton Folliot, near Plymouth, *Briggs*—Var. *nutans* Rogers (*R. foliosus* Weihe, Fl. Plym.). 3. Cornwood; Denham Bridge, *Briggs*.

R. pallidus Wh. & N. 3. Near Moreton-Hampstead Hill. 4. Okehampton Park, a slender, weakly-armed, shade-grown form.

R. scaber Wh. & N. 3. Roborough Down, near Yelverton. Longcross, near Milton Abbot. Bickleigh Vale, *Briggs* and *Focke*. Occurs in several N. Devon localities, but all of them at a distance from Dartmoor.

R. thyrsiger Bab. (*R. Bloxamii* Lees, Fl. Plym.). Locally abundant. 3. Near Milton Abbot, *F. A. R.* (not quite typical); Honicknowle and Bickleigh Vale. Shaugh Bridge; Crabtree; Egg Buckland, &c., *Briggs*. 4. Quarry, near Okehampton.

R. longithyrsiger Bab. (*R. pyramidalis* Bab., Fl. Plym.). Widely distributed and locally very abundant. 3. Knighton

Heath and elsewhere between Teign Valley and Hey Tor; Ilsington. Chagford and Fingle Bridge, *Briggs*. Lydford and roadside to Brent Tor; Roborough Down. Yelverton to Dousland, *M. A. R.*; frequent along the western border of the moor. Numerous localities near Plymouth (Fl. Plym.). 4. Near bottom of Lydford Waterfall.

R. botryeros Focke (*R. Lejeunei* Weihe, Fl. Plym.). 3. Shaugh Bridge; Yennadon Down, near the Reservoir; Egg Buckland parish, in several places. Coleridge; Cornwood, *Briggs*.

R. foliosus Wh. & N. (*R. Güntheri* Weihe, Fl. Plym.). 3. Locally abundant; Christow and Canonteign Downs; Nitton Cleave; Knighton Heath. Bickleigh Vale to Egg Buckland; Cornwood, *Briggs*.

Koehleriani.

Quite rare.

R. rosaceus Wh. & N. 3. Longcross, near Milton Abbot, 1910. Budshead, near St. Budeaux; Fancy, *Briggs*. Mr. Briggs considered that he had also found this near the border of the moor at Meavy and by the Canal, Plym Valley, but I have no specimens from those localities.—Var. *hystrix* Wh. & N. 3. Tamerton Folliot and near Stover Lodge, *Briggs*; a strong form near *R. apricus* Wimm. 4. S. Tawton; Okehampton.—Var. *infecundus* Rogers. (This, or forms very near it.) 3. Roborough Down and wood near Dousland. Shaugh Bridge; Bickleigh Down; Derriford; Plym Valley, *Briggs*.

R. Koehleri Wh. & N. Rare. 3. Hennock; Trusham.

R. dasyphyllus Rogers. Rare. 3. Hey To Down. Near Chagford, *Briggs*; Roborough Down, seen in two spots only in 1910.

R. Marshalli Focke & Rogers, var. *semiglaber* Rogers. 3. By the tram, Fancy, *Briggs*, 1870.

Bellardiani.

Very rare.

R. divexiramus P. J. Muell. 3. Beer Alston to Tavistock, *Briggs*.

R. hirtus Waldst. & Kit., var. *rotundifolius* Bab., locally abundant. 3. Teign Valley and high ground near, almost to Haldon, frequent; Holly Street, Chagford. Gidleigh and Throwleigh, *Briggs*. 4. N. Tawton, *Waterfall*. S. Tawton; Sticklepath; Okehampton. — Var. *Kaltenbachii* (Metsch.)? (This, or form very near it, in plenty.) 3. By R. Meavy, near Yelverton.—Var. *rubiginosus* (P. J. Muell.). 3. Brent Tor to Lydford, quarry near railroad; Bickleigh Vale.

Cæsii.

Only very locally common.

R. dumetorum Wh. & N., var. *diversifolius* (Lindl.). 3. Haldon; Teign Valley, frequent; Moreton-Hampstead; Holly Street, Chagford; not seen on the western border, where, in the Brent Tor neighbourhood, its place is taken by a form nearer to my var. *britannicus*; Egg Buckland and elsewhere near Plymouth;

Cornwood.—Var. *tuberculatus* Bab. 3. Near Chudleigh. Plants thus named by Mr. Briggs occur at Cholwicktown and elsewhere between the moor and Plymouth.—Var. *raduliformis* Ley. *3. Lydford and Tavistock Road, near Brent Tor, 1910. A form with exceptionally weak prickles and irregular leaf-toothing.

R. corylifolius Sm., *α sublustris* Lees. 3. Frequent, locally. Ilsington; Teign Valley—Knighton Heath, by Trusham and Teingrace to Newton Abbot; about Chudleigh and towards Haldon, common; Lydford to Brent Tor and the Tor, frequent, but varying greatly in luxuriance; Whitchurch Down; Plymouth neighbourhood, frequent.

R. Balfourianus Blox. Rare. 3. Near Tavistock, *F. A. R.*; a very handsome plant, which, though stouter and with thicker leaves than the type, cannot, I believe, be kept distinct from it. I have seen a specimen of the type collected by Mr. Briggs at Orcheston, near Kingston; but that station is distant from the moor. The species is also frequent between the Upper Tamar and Holsworthy in N. Devon, at a still greater distance from Dartmoor.

R. caesius Linn. Very local. 3. Haldon; Ilsington; Trusham; Newton Abbot; Lydford; Brent Tor. Oreston Quarries; Stoke Damerel and elsewhere near Plymouth, *Briggs*.

R. saxatilis Linn. 3. "Common Wood, Egg Buckland, on a bushy bank at an elevation of only 200 ft.," *Briggs*. I have a specimen collected by Mr. Briggs in this locality in May, 1872, and a note of his that he saw it there in 1881–1885 and July, 1888. The only other two Devon localities known to me are in the Lynton district.

ADDITIONS TO THE FLORA OF HONGKONG.

By S. T. Dunn, B.A., F.L.S.

Melodorum Uonicum, sp. n. Frutex magnus, diffusus, floribus et alabastris exceptis, glaber. Folia anguste oblonga, 8–12 cm. longa, 2–3 cm. lata, coriacea, subtus brunnea, apice basique obtusa, venis lateralibus utrinque 12–16, venulis laxe reticulatis, petiolis 6–8 mm. longis. Flores solitarii axillares, pedunculis sericeis, 15 mm. longis, bracteolatis; petala 6, valvata, ovata, acuminata, carnosa, exteriora sericea 1½–2 cm., interna glabra, 8–14 mm. longa; ovaria 6, puberula, 8–16-ovulata; stigmata parva integra.

Wood borders and bushy ravines in Hongkong and the neighbouring islands, flowering in April. Hongkong, April 9th, 1893, *Tutcher*, Herb. Kew.; *Ford*, n. 494, Herb. Kew.; Hongkong, road from Tytam to Wongneicheong, Herb. Hongk. n. 5251; Lantao Island, *Tutcher*, 1896, Herb. Hongk.

The affinities of the species are with *M. glaucescens* Hance and *M. Oldhami* Hemsl., from the former of which its larger flowers distinguish it, while it differs from the latter in its glabrous, loosely and irregularly reticulate (not finely trabeculate) leaves. The specific name commemorates the services of an old

Hakka plant collector named Wu On, who possessed to an unusual degree, even for a Chinaman, the natural gifts which make for success in his calling.

MELODORUM OLDHAMI Hemsl. Descriptioni addendum; Petala 6, carnosa, valvata, exteriora sericea, ovata, acuminata, 15–18 mm. longa, interiora angustiora, paullo breviora.

Only recorded hitherto from Formosa, but now known in the islands of Hongkong and Lantao.

VIOLA VERECUNDA A. Gray. Found by Sampson on the White Cloud Hills, near Canton, but unknown in the colony of Hongkong until found by Mr. Tutcher and myself growing in plenty by rivulets at the foot of Taimoshan in February, 1909.

Eurya muricata, sp. n. Frutex erecta vel arbor parva, omnino glabra. Folia elliptica regulariter et crebre serrulata, 6–7 cm. longa, chartacea, nuper evoluta metallice cœrulea, apice obtuse acuminata, basi sæpius cuneata, petiolis 4 mm. longis. Flores 2–3-ni, axillares, pedunculis brevissimis; sepala rotundata, 1–2 mm. longa; corolla 2–3 mm. longa, alba; ovarium conicum; stylus cylindricus in stigmata 3, æquilonga vel paullo breviora, recurva abiens. Bacca pisiformis, 4 mm. longa, brunnea, muricata.

On the open rocky slopes of the lower hills round Hongkong, as well as in other parts of Eastern Kwangtung.

San-ning, S. Kwantung, *Dunn's Chinese collector*, n. 877; Mount Gough, Hongkong, Herb. Hongk. n. 1772; Forestry Block 1A, Hongkong, *Dunn*, March 14th, 1909.

The species differs from *E. Macartneyi* Champ. in its united styles, and from *E. japonica* Thunb. in its finely serrate leaves, glabrous buds, round twigs, and muricate fruit.

TEPHROSIA VESTITA Vogel. Lantao Island, August, 1886. A Javanese and Philippine species, new to the colonial flora, though once found by Vachel near the neighbouring port of Macao.

Psychotria Tutcheri, sp. n. Frutex erectus, 1½–2 m. altus, corollis exceptis, glaber. Folia ovato-lanceolata, 10–15 cm. longa, chartacea, apice basique gradatim acuminata, venis utrinque 11–13, petiolo 5–15 mm. longo; stipulæ interpetiolares ovatæ, acuminatæ, geminis setis terminatæ, 4–6 mm. longæ. Corymbi axillares terminalesque. Calyx 1–1½ mm. longus, lobis tubo brevioribus; corolla tubulosa alba, tubo 2 mm. longo, 1 mm. diam., fauce lanato, lobis patentibus, lanceolatis, 1 mm. longis; stamina paullo exserta; ovarium biloculare; stylus bifidus; bacca globosa, rubra, carnosa, 5 mm. diam., pyrenas 2 plano-convexas, dorso multicostatas includens.

Shady woods in the Happy Valley, Hongkong, *Tutcher*, May 12th, 1906, and May 15th, 1906 (flower), Oct. 8th, 1906 (fruit), Herb. Hongk. nos. 4570, 4601, 4651.

Closely similar in general appearance to *P. elliptica* Ker, and thus previously overlooked. The shapes of the corolla and of the stipules are sufficient to distinguish the two species.

QUERCUS SYNBALANOS Hance. Descriptioni addendum: Fructus in apice pedunculorum crassorum glomerati, involucro depresso,

squamis brevibus, lanceolatis, pubescentibus, adpressis obtecto, glande depresso-globosa, involucri margine retenta, apice sericea.

The acorns of this Oak were not known when Hance described it in 1884, but a few years later Westland, then Assistant Superintendent of the Botanical and Forestry Department of Hongkong, succeeded in finding one fruiting peduncle in the original locality on the mainland opposite Hongkong Island. The nature of the acorns confirms Hance's location of the species in the section *Pasania*.

ALPINIA FORMOSANA K. Schum. Descriptioni addendum: Herba 2–3 m. alta. Paniculæ fructiferæ nutantes subsimplices, pedicellis rigidis, divaricatis. Capsula ovalis, glabra, 2–2½ cm. longa, calycis residuo coronata, epicarpio chartaceo, pallide brunneo, 15-20-costato, dehiscentia loculicidale tarda; semina 30–40, angulata, alba, 3 mm. diam.

Near New Little Hongkong Village, Hongkong, *Dunn*, August 17th, 1909, Herb. Hong. n. 7190.

The discovery in the colony of this species, which had previously been considered endemic in Formosa, was due to the accidental meeting between myself and some Hakka fishermen who were carrying bundles of fruiting stems of this *Alpinia*. In reply to my inquiries they stated that they used the seeds as a spice, and that the plants grew not far off along the edges of the seaside meadows, whence the specimens described above were afterwards obtained.

CAREX BACCANS Nees. This striking sedge, which had only been localized in China previously from Formosa, is now known from the colony, having been gathered by Mr. Tutcher at a height of 1500 ft. on Taimoshan (Herb. Hongk. n. 7054).

CAREX BRUNNEA Thunb. An addition to the sedges of S.E. China. Found in a single locality in Hongkong by the writer, *viz.* on the dry bushy bank above the road south of Magazine Gap (Herb. Hongk. n. 7187).

Carex canina, sp. n. Folia basalia 30-40 cm. longa, 3–4 mm. lata in marginibus et venis superne scabra. Scapi 20–30 cm. basi foliis brevibus paucis suffulti. Spicæ 3–4, approximatæ vel una distans, viridulæ; bracteæ inferiores spiculis longiores. Spicæ inferiores fœmineæ, paucifloræ, in fructu ovatæ, 12 mm. longæ, 6 mm. latæ, pedunculis 10 mm. longis, parte majore in bracteæ vagina inclusa; superiores fœmineæ similes sed minores, suprema mascula, 10 mm. longa, 1–2 mm. lata. Glumæ fœmineæ utriculis breviores, ovatæ, acuminatæ, scariosæ, costa viridi excurrente, masculæ similes; utriculus ellipsoideus, gradatim rostratus, rostro bifido, 7 mm. longus, membranaceus, glaber, striatus, basi obtusus; nux parvus, stipitatus, rostratus, apice disciferus, utriculum implens; stylus trifidus.

Hongkong, Lantao Island, March 16th, 1909, *Dunn*, n. 7154.

LEERSIA HEXANDRA Sw. Taimoshan, *Dunn*, Sept. 3rd, 1909. An addition to the colonial flora, though previously found by Sampson near Canton, less than one hundred miles away.

THREE SOUTH WALES HAWKWEEDS.

By Rev. Augustin Ley, M.A.

The following Hawkweeds seem to differ from any of the forms which find a place in our lists, and to be worthy of description. They have been under observation for a considerable period, and nothing could in any probability be gained by further delay in publishing them.

Hieracium silvaticum Gouan var. crassum, nov. var. Stem 14–16 in. robust, erect, 1–2-furcate; branches straight, suberect; nearly epilose at base, the branches and peduncles bearing slight hair and floccum. Root-leaves about five, the primordial subrotund, the later oblong or elliptic, large and long; base cuneate, with several often large teeth, and slightly toothed above; outer obtuse, innermost acute, green or reddish or tricolorous. Petioles shaggy; under side and edge of the leaves with rather stiff hair; texture thick. Stem-leaf 1, petioled, elliptic- or ovate-lanceolate, acute; or reduced to a bract. Heads 2–5, rather large, truncate; phyllaries short, broad, senescent, the outer obtuse; pilose and with scattered floccum, glands 0 or very few. Ligules full yellow, glabrous-tipped; style livid.

This reminds one of *H. hypochæroides* Gibs. var. *lancifolium* W. R. Linton, but really nearer to the var. *tricolor* W. R. Linton of *H. silvaticum* Gouan (under which name I distributed it through the Botanical Exchange Club in 1908); differing from it in the more robust habit, longer, more deeply toothed and cuneate-based leaves, &c. In cultivation these differences are increased. West Brecon; at Pwll Byffre, 1906, 1908.

Hieracium sparsidens Dahlst. var. elatius, nov. var. Stem 18 in. to 2 ft., nearly glabrous below, in the upper half bearing a few glands and a little floccum, the glands becoming more numerous and the floccum denser on the peduncles; glands unequal, some long-stalked. Root-leaves large, ovate; lowest cordate, innermost cuneate-based; all except the primordial acute, the innermost very acute; bearing some large broad-based acute teeth on the lower half, or nearly entire; hair of the leaves not abundant, sub-setose. Leaf-colour full or dark green. Stem-leaves 1–2 (mostly 2), large, similar to those of the root, but longer-pointed, the lower long-petioled. Panicle usually rather close, subumbellate, with the peduncles slightly curved, 6–8-headed; heads truncate. Phyllaries shorter than the pappus, greenish- to dark-brown, densely glandular, epilose, etomentose, esenescent. Ligules glabrous-tipped; style yellow, at least on first maturing. Receptacle (observed on the cultivated plant) with very prominent subulate teeth.

Abundant in the wooded rocky glen of the Taf-fechan, Brecon Beacons. Hedge-bank at Capel-y-ffin, Black Mountain, Brecon (a form with slightly narrower leaves).

Sent to Dahlstadt in 1908; his reply being as follows:—"This form is a distinct form of *silvaticum*, on the one hand

coming near *H. Stenstrœmii*, on the other hand *H. sparsidens*." To the latter (as represented in the Kew Herbarium) the resemblance is great; the Breconshire plant differing from typical *sparsidens* chiefly in the two stem-leaves, in the leaves being all more acute, with teeth not reaching the cuneate not decurrent base; the leaves and petioles less hairy and the styles yellow. Remains constant in cultivation.

Hieracium rectulum, sp. nov. Stem stiff, erect, 1 ft. to 18 in., clothed with shaggy hair at base, as also are the petioles of the lower leaves; the hair giving place on the upper portion and peduncles to slight floccum and slender stalked glands. Root-leaves few, 1–4, early withering, oval to elliptic, subacute, gradually narrowing to base, firm but not thick in texture, reddish; clothed on under surface and edges with firm, subsetose hairs, the upper surface less hairy. Stem-leaves 1–2, often with 1–2 narrow bracts above them; shortly petioled, broader at base and more acute at point than those of the root, similarly coloured. Panicle 1–2-furcate, with straight branches, or subumbellate. Heads 3–5, short, truncate; phyllaries very dark, epilose, almost esenescent, bearing numerous subequal stalked glands, the outer with an evident floccose margin, the inner broadly diaphanous-margined. Ligules glabrous-tipped, full yellow; styles very dark.

Unknown to Dahlstadt, to whom it was sent, and whose verdict was:—"Leaves towards *centroides* [*cerinthoides*]; none of ours." The plant has a much more evident relationship to *H. vulgatum* Fr. than to any of the *Cerinthoidea*, and will be best placed, in the writer's judgement, next to *H. duriceps* F. J. Hanb. in our list.

On lime rocks at the head of the hills south of Llangadoc, Carmarthenshire, at about 1500 ft. elevation; plentifully at a single station, 1907.

A plant collected by Rev. E. S. Marshall at the Upper Lake, Killarney, in 1902 (ref. no. 2658), is similar in appearance, but details do not agree.

LATHYRUS TUBEROSUS IN BRITAIN.

By J. C. Shenstone, F.L.S.

Mr. Miller Christy suggests (p. 173) that Gerard, in his *Herbal*, has confused *Lathyrus tuberosus* with *L. macrorrhizus*, and (p. 171) tells us that Mr. H. W. King had shown a specimen of *L. tuberosus* from Canvey Island, Essex, to an "eminent floriculturist," who had at once recognized it, and had told him that it was brought from Holland about the year 1506. Both these statements seem worthy of further consideration; and the following references to this plant in old English works will serve, I hope, to contribute to our knowledge of it in Britain, and add some details to Mr. Christy's valuable article.

By tracing the statement made by the "eminent floriculturist" to its origin, we shall find that it was, almost certainly, based

upon an interesting chain of errors, which were founded upon a statement made in the 1596 edition of Gerard's *Catalogus*, a list of plants cultivated by himself. Gerard and the earlier English herbalists certainly did confuse *L. tuberosus* with *L. macrorrhizus*. The first printed record of the cultivation of *L. tuberosus* in Britain is that of John Parkinson in his *Theatrum Botanicum*, p. 1062 (1640), and the second that in Aiton's *Hortus Kewensis*, iii. 42 (1789), though, as Mr. Christy suggests, the plant was most likely cultivated in the years 1621 or 1622 by the Dutch labourers who came to England to embank Canvey Island.

There is no known printed work upon plants corresponding to the date (1506) attributed to King's "eminent floriculturist"; but if we refer to the gardening dictionaries in use in the nineteenth century (*e. g.* Paxton's *Botanical Dictionary*, 1849, and the later editions of G. W. Johnson's *Gardeners' Dictionary*), we find that the plant is recorded in them as having been introduced from Holland in 1596. It is almost certain, therefore, that 1506 was wrongly printed for 1596 in the *Essex and West Suffolk Gazette*, in which Mr. H. W. King recorded the plant (p. 171).

The date 1596 probably originated with the second edition (1812) of Aiton's *Hortus Kewensis*, a catalogue of plants cultivated in the Royal Botanic Garden at Kew. In the first edition (iii. 42), as has been said, the date is given as 1640, a statement which we shall find to be correct, but, in the second edition (iv. 309) we are told incorrectly that the plant was cultivated by Gerard in 1596; this is almost certainly the authority copied by Paxton, Johnson, and later writers.

Having failed to identify any of the plants in the 1596 edition of Gerard's *Catalogus* as *Lathyrus tuberosus*, Dr. B. Daydon Jackson suggested to me the following explanation of Aiton's error:—In the 1596 edition of Gerard's *Catalogus* he mentioned a plant which he calls *Apios Fuchsii*, and it is upon this record that Aiton appears to have founded the statement made in the second edition of *Hortus Kewensis* (1812). It is, however, incorrect, for, although the *Apios* of Fuchs was undoubtedly *Lathyrus tuberosus*, the plant which Gerard cultivated was certainly not that plant. In the second edition (1599) of Gerard's *Catalogus*, the English as well as the Latin names of the plants are given by the author, and one finds that the English name of the plant he cultivated was the "Knobbie Spurge" (*Euphorbia Apios*). Gerard certainly knew his plants too well to have confused a *Lathyrus* with an *Euphorbia*.

We will now consider Mr. Miller Christy's statement that Gerard, in his *Herbal* (1597), confused *Lathyrus tuberosus* with *L. macrorrhizus*. In the *Herbal* we find (p. 1057), under the heading "Pease Earthnut," an undoubted figure and description of *L. tuberosus*. This is as we should expect, for we are told by Johnson, in his introduction to the second (1633) edition of Gerard's *Herbal*, that Gerard compiled his work from a manuscript translation of the 1583 edition of the *Pemptades* of Dodoens by Priest, who translated it from a French translation by L'Ecluse.

Dodoens was a Flemish man, and was, therefore, doubtless familiar with *L. tuberosus*, which was common in the cornfields of Holland. But Gerard, after describing the plant correctly, adds the information that it is found in divers woods and pastures of England, "especiallie in Hampsteed woode neere London. It groweth in Richmond Heath and in Coome Parke likewise." These localities are obviously habitats in which we should expect to find *L. macrorrhizus*, but not *L. tuberosus*. The latter two places mentioned are certainly copied from earlier English herbals, for Lyte, in his translation of an earlier edition of Dodoens, 1578 (p. 491), describes and figures the "Pease Earthnut" (*L. tuberosus*), and adds that this plant "groweth in Richmonde Heath and Coome Parke as Turner saith."

When we refer to Turner's *Herbal* (1568), we find (p. 71, corrected to 75) that he also has evidently confused these two plants, for under the heading of "Astragalus" he gives a figure which clearly represents *L. tuberosus*, and he says of it:—"Astragalus is named about Colon, Erdekelen, in Nederland, Erdnutte, in Duerlad, ein Erdtnuss. I have sene it in England in Come Parke and in Rychemonde heth. But I never coulde learne the name of it in Englishe. I am compelled for the lacke of another name of it, to call it Peese Earthnut, because it hath leaves lyke a little Peese or Ciche, and rootes lyke an earthnut." That Turner confused these plants is also shown by referring to another plant which he describes in the same herbal, and which he calls "Apios, Ernutte." Under this heading Turner gives a figure and description of a plant (p. 51 (55)), which may be either *Conopodium denudatum* or *Carum Bulbocastanum*, and he adds to this description a note upon another plant, which he calls "Duche Erdtnuss," and which is doubtless *L. tuberosus*. He says that the nuts of this latter plant do not "purge upwards and downwards," and he concludes, therefore, that it is not the "Apios" of Dioscorides, as stated by Amatus, because that plant had these unpleasant properties.

Any doubt, however, which may remain as to the plant to which these early herbalists referred and which grew on Richmond Heath, &c., is removed by Johnson in his edition of Gerard's *Herbal* (p. 1237), for in this work, under the heading of "Pease Earth Nut," we find two figures. Johnson calls the first "*Terræ glandes*," or "Pease Earth Nut," which clearly represents *L. tuberosus*, and tells us that it "groweth in corne fields, both with the corne itself and also about the borders of fields, among briers and brambles," adding that "it is found in divers places in Germany, *but not with us that I can learne*." The second illustration, which Johnson names "Astragalus sylvaticus, Wood Pease, or Heath Pease," clearly represents *L. macrorrhizus*, while he tells us that "this is found in the woods and pastures of England, especially in Hampstead wood, neere London: it groweth in Richmond Heath and Come Park likewise." He also tells us (p. 1236) of this latter plant, that "This with Thalius in his *Sylva Harcynia*, set forth by the name of *Astragalus sylvaticus*, was by

our author [*i. e.* Gerard] taken and confounded with *Terræ glandes* [*L. tuberosus*], and therefore I have put it with it, that the difference might the better appeare, which is not a little to such as heedfully observe it; but our author in this is to be pardoned, seeing Dr. Turner, a man more exquisite in the knowledge of plants, and who had seene the true *Terræ glandes* in Germany, mistooke this for it, as may appeare by that little tract of his of the names of plants . . . : for there he saith I have seen this herbe of late in Come Parke more astringent than it of Germany . . . and indeed this grows there, and is much more astringent than that of Germany, and nowise fit to be eaten." *

With regard to the cultivation of *L. tuberosus* in Britain, we find in Parkinson's *Theatrum Botanicum* a clear statement, which not only confirms Johnson's earlier statement that the habitats of Turner and Gerard referred to *L. macrorrhizus*, but also gives us the first printed record of the cultivation of *L. tuberosus* in Britain. Under the heading: "*Fourth. Lathyrus arvensis*, sive *Terræ glandes, Pease Earth-Nuts*," Parkinson gives a correct figure and description of *L. tuberosus*, to which he adds the statement "Bauhinus [*Pinax*, 344] maketh it and the next to be both one plant"; then follows the heading: "*Fifth. Lathyrus sylvaticus lignosior. Our Wood Earth Nut*," under which we find a figure and a description, both of which undoubtedly represent *L. macrorrhizus*. Parkinson adds that "the fourth [i. e. *L. tuberosus*] is said by Gerard to grow in many places with us, as Hamsted, Coume Parke, etc., but we rather thinke it was the next [i. e. *L. macrorrhizus*], for the rootes we have hitherto found in our woods and hedges sides have been more woody than the other sorts; which growing in our gardens wee have seene to be more tender, and *came to us from beyond Sea*, the last is found oftener than men would have it being a plague in the field or orchard where into it once getteth."

We have twice referred to a plant called *Apios*. Some confusion was caused by the attempts of early herbalists to identify the *Apios* of Dioscorides. It will be well, therefore, to conclude this note with a few words upon those plants which were identified by herbalists as "*Apios*." Turner, in his *Herbal* (1658), criticizes the attempts of earlier writers, but appears to have been in some doubt himself as to the true *Apios*. Under the heading of "Apios, Ernutte," he figures and describes a plant which might be either *Carum Bulbocastanum* or *Conopodium denudatum*. These two plants are very similar in all their parts, and both grow within reach of London; but it seems probable that his figure is intended to represent the common English plant (*C. denudatum*). Bauhin (*Pinax*, 162) has identified Turner's *Apios* as *C. Bulbocastanum*, and some botanists have accepted this identification; this author, however, was not familiar with the British flora. The *Apios* of Dodoens, Gerard, and half a dozen other writers was,

* The tubers of *L. macrorrhizus* were, however, formerly eaten by the Scotch Highlanders. Smith's *English Flora*, 1825, vol. iii. p. 272.

certainly, the Knobbie Spurge (*Euphorbia Apios*). On the other hand, the *Apios* of Fuchs and one or two other writers was *Lathyrus tuberosus*,* called by the Dutch "Erdnut." It will be observed that three of these four plants have been known as "Earthnuts," and are edible, the fourth (*Euphorbia Apios*) is not edible, for it would be very likely to possess the unpleasant properties ascribed to the *Apios* of Dioscorides of "purging upwards and downwards."

[I may take this opportunity of referring to Mr. Christy's remarks (pp. 173, 174) as to Buddle's specimens, and to his correction of my inference (p. 353) that the specimen in Buddle's herbarium was collected in Suffolk. I have not yet been able to look through Buddle's MS. *Methodus*, though I hope to do so before completing my Catalogue of the Sloane Herbarium, but the quotation from this which Mr. Christy gives makes it clear that Buddle's plant, if of English origin, came from Lincolnshire, not from Suffolk. But it must be remembered that Buddle's specimens are not always British; see H. S. 121 f. 15 verso, where he has appended to a specimen of *Salvia pratensis* the note—"Dr. Plukenet asserts this to grow wild in some places of England," thus implying that the specimen itself is not of English origin. Buddle's name was so much connected with Suffolk botany that it is easy to suppose that Dale may have assumed that the specimen sent him had been found by Buddle in that county; it seems hardly likely that Buddle would have thought it worth while to send him a cultivated example. Moreover, the two specimens so closely resemble one another that they might easily have been of the same gathering. I think the "two counties" may be reduced to one, and agree with Mr. Christy that the record must be regarded as doubtful.—JAMES BRITTEN.]

SHORT NOTES.

MIDDLESEX PLANTS. — The occasional mention of Hampton Court Park in Mr. Druce's "Notes" (pp. 269–277) reminds me that this locality produces many plants of rare occurrence near the Metropolis. It was in the Home Park, Hampton Court, that I first saw *Wolffia arrhiza*, for the knowledge of which I am indebted to my friend Mr. James Holloway, an indefatigable searcher after pond-life. West Bedfont is another Middlesex locality where Mr. Holloway has found *Wolffia*. A form of *Geranium molle*, with petals twice as long as sepals (? var. *grandiflorum* Lange), grows on the towing-path near Hampton Court. By the Thames, between Kingston Bridge and Hampton Court,

* In the *Names of Herbes* (1548) Turner says: "Apios. It groweth plentuously in Northumberland." This favours the conclusion that Turner identified *Apios* with *C. denudatum*, for *Carum Bulbocastanum* is confined in Britain to Herts, Cambridgeshire, Bedford, and Bucks, and this identification is given by Mr. Britten in his reprint of the *Names of Herbes*.

are to be found *Rhamnus catharticus*, *Atropa Belladonna*, *Nepeta Cataria*, *Rumex sylvestris*, *Allium vineale* var. *bulbiferum*. Among turf in the Home Park grow *Taraxacum erythrospermum* and *Myosotis versicolor* var. *Balbisiana*. Besides the *Utricularia* mentioned by Mr. Druce, other aquatic plants of interest to be found in the Home Park are *Nymphoides*, *Hydrocharis*, *Sagittaria*, and *Butomus*. The form of *Radicula amphibia* growing by the river between Hampton Court and Kingston Bridge is probably var. *variifolia*; the lower leaves are remarkably pinnatipartite, and wither away before the time of flowering. At Sunbury, not far from Hampton, Mr. Holloway found, this year, the American *Azolla caroliniana*. The locality, which I have visited, is a drain running into the Thames from the waterworks. The same observer has sent me a supply of *Azolla* from White Webbs, near Enfield, where, he writes me, it grows in great quantity on the northern section of the old New River channel that is now cut off from the main stream. In the late summer the *Azolla* dominates this channel to the exclusion of all other aquatic plant-life, and imparts a red colour to the surface of the water that is very striking. Other Middlesex plants for which I have notes are, *Potentilla procumbens* × *reptans* (so named for me by the late Mr. W. H. Beeby), from near Northwood, and *Ophioglossum vulgatum* L. from the meadows between Northwood and Harefield.—C. E. Britton.

A New Variety of Rosa hibernica.—At a second visit to Port Seaton where, as recorded on p. 260, I had met with a rich colony of *R. pimpinellifolia* × *rubiginosa*, I had the good fortune to find a variety of *R. hibernica* Sm. which is, I believe, quite new and undescribed. It differs from all hitherto recorded varieties in the following points:—Its leaflets, instead of having the teeth irregularly simple, have a serration copiously compound, with one to three denticles on the lower edge and occasionally one on the upper. The peduncles are sometimes naked, generally with a few glandular hairs, and more rarely, pretty thickly hispid. The sepals are thinly glandular on the back, and, as far as I could judge in the state they were in, they were nearly simple, the larger with very few linear appendages. As in some other forms of the hybrid the under side of the leaflets seems to be pretty thickly covered with longish hairs in the young stage, but the hairs are in great part deciduous, so that in the older leaves they are confined to the midrib or, rarely, entirely gone. In the form which Déséglise named *R. armatissima* the leaves are described as irregularly biserrate, but without glands and quite glabrous. Christ and Crépin believed this to be *R. pimpinellifolia* × *canina* var. *dumalis* Bechst. In a specimen which I have from Mr. Marshall (Ref. no. 1890, near Brora) under the name *R. glauca* × *pimpinellifolia* the serration is irregularly biserrate, usually with one glandular toothlet in the lower edge, but, at least towards the inflorescence, there are many simple teeth. Like the last this is a glabrous form, and like it also it has the peduncles and backs of the sepals bare of glands. In my opinion it is *R. pimpinellifolia*

crossed with a variety of *R. glauca* Vill. of the group *Subcristata* Baker. But, so far as I know, neither in Britain nor on the Continent has the hairy form of the hybrid ever previously been found with compound glandular serration. The Port Seaton plant I believe to be *R. pimpinellifolia* crossed with a variety of *R. coriifolia* Fr. with compound serration, with peduncles hispid and sepals glandular on the back—a variety which Baker would call *R. canina* L. var. *Watsoni* Baker, with hispid peduncles and sepals glandular on the back. The sepals become erect, but fall before or at the ripening of the fruit, which seems to mature somewhat earlier than in the Irish form. I am sending specimens of this and of *pimpinellifolia* × *rubiginosa* to the National Herbarium at South Kensington and to Kew.—W. Barclay.

The Pink Hybrid Campion (*Lychnis alba* × *dioica*).—I recently came across this interesting natural hybrid in a hedgerow near Wellington, Somerset. The plants occupied a space about ten yards in length. The subsoil is sandstone, possibly slightly calcareous. At one end of the group *L. alba* occurred, and at the other end *L. dioica*; whilst between were the hybrids. The whole appearance was very striking. The hybrids were variable in character, as was shown by the colour of the corolla, the inflation and colour of the calyx, and the length of the pedicels. The following is a summary of the chief forms of the hybrid plants:—

(*a*) Hybrids with the characters almost of *L. alba*, but with a pale pink corolla; calyx inflated, green or faintly tinged with red.

(*b*) Hybrids with pale pink corolla; calyx less inflated than in *L. alba*, and distinctly reddish or red-streaked.

(*c*) Hybrids with corolla of a deeper pink, approaching *L. dioica*; calyx more inflated, however, and red.

(*d*) Hybrids of a less distinct type, with corolla having a pink flush only, and otherwise like *L. alba*.

The arrangement of the plants in the hedgerow is roughly indicated in the following scheme:—

Whites. (Typical *L. alba*).	Whites and a few inflated Pale Pinks (*a*).	Pinks. (*a*), (*b*), and (*c*).	Reds. (Typical *L. dioica*).

The pedicel varied between the long pedicel of *L. alba* and the short one of *L. dioica*. Another variable character was seen in the dissection of the petals, this showing differences of depth and character. The intermediates agree fairly well with the crosses produced by Gaertner and by recent Mendelian workers. The conspicuousness of the hybrids is very probably due to the character (mentioned by Gaertner) of their flowers not exhibiting the diurnal movements. On the whole, the case appears to be interesting as illustrating the occurrence in nature of phenomena which have been obtained in Mendelian crossings.—S. R. Price.

Erica vagans × cinerea.—I have just received from Mr. P. D. Williams, of Lanarth, St. Keverne, two flowering shoots of a heath gathered in the Lizard district which obviously is a hybrid between *Erica vagans* and *E. cinerea*. Superficially, it looks like a

plant of the former bearing flowers of the latter. Mr. Williams informs me that plants of this hybrid were found in the same locality nearly fifty years ago by his uncle, the late Mr. Richard Davey, M.P. for West Cornwall, but no record of the fact appears to have been published, and the plant remained unnoticed until the last week in October, when Mr. Williams had the good fortune to rediscover it. Following is a description drawn up from the two pieces sent to me: Flowers mostly erect, long-stalked, in loose umbellate heads below extremity of branch, with sometimes a larger terminal umbel. Pedicels with three or four scattered pale linear-lanceolate bracteoles; pedicels, bracteoles, and margin of sepals, hairy. *Corolla urceolate*, rose-coloured, rather smaller than in *cinerea*, teeth about one-sixth of the whole length. *Stamens similar to those of vagans, but all included within the corolla.* Style exceeding corolla by about the length of the teeth. Ovary hairy. The two parents are so common over the Lizard district that, now attention has been directed to it, further search will probably show that the hybrid is anything but rare.—F. Hamilton Davey.

Cochlearia micacea in Peebles-shire.—While botanizing on August 1st last along the north-eastern boundary of Peebles-shire (v.-c. 87), I came across a *Cochlearia* growing in a small mossy spring associated with *Saxifraga Hirculus*. Except for the shape of the petals it seemed to agree with *C. micacea*, so I dispatched some specimens to Mr. Marshall, who kindly examined them and identified the plant as the same long-podded form which occurs on the summit of Am Binnein, Mid-Perth, where I have also seen the plant. The low altitude (1000 ft.) at which it occurred is singular, the usual range being from 2500 to 3500 ft. It is also a considerable extension southward in Scotland, as it was not previously recorded south of Perth and Forfar, though making its appearance again on the Snowdon range. I fancy the plant here must be very local, as a large number of similar places were examined, as also some of the tributaries of the Medwin draining from the Lanarkshire side, but we did not see it again. Still investigation should be made both there and in Edinburgh, in both of which counties it may have been overlooked.—McTaggart Cowan, Jun.

Ruppia rostellata in v.-c. 74.—In looking over some specimens in the herbarium of Mr. A. J. Crosfield, I came across the above plant labelled: "Stranraer. Dr. Greville." I cannot find that it has yet been placed on record for v.-c. 74, Wigton.—C. E. Salmon.

REVIEWS.

Ancient Plants. By M. C. Stopes, D.Sc. 122 Illustrations and Figures, including many Photographs. 8vo, cl., 198 pages. London: Blackie & Son. 1910. Price 4*s.* 6*d.* net.

The study of fossil plants has brought to light during recent years many facts of considerable interest both to the botanist and

to the student of evolution. But as most of the recent advances have been brought about by the investigation of the anatomical features of our specimens, their results have only been intelligible to those who have had considerable botanical training. Miss Stopes has endeavoured to summarise our knowledge of this subject in a way which can be understood by all those having any knowledge of botany. The first seven chapters deal with general questions; chapter ii. is on the different kinds of fossil plants, and chapter iii. deals with the subject of coal. Chapter iv. treats of "the seven ages of plant life"; it is difficult to see why the author divides up the past history of plants in the way she has done. It would be very interesting to know what were the "marked changes in the character of the vegetation" corresponding to the separation of age vi., the older Palæozoic, from vii., the Archæan; for unfortunately they are changes which only exist in the imagination. After dealing with the stages in plant evolution as illustrated by modern plants, the author in the next two chapters gives an outline of the somewhat extensive subject of anatomy; giving sketches of the chief constituent tissues. These chapters form a useful preface to the more detailed account of the anatomy of each group which is given later, though it is doubtful whether they will prove sufficient for a reader who has no previous anatomical knowledge.

Chapters viii.–xvii. give brief accounts of our knowledge of the past history of the principal plant families. In chapter viii. the author rightly emphasises the isolation of the Angiosperms from the rest of the plant world and the comparatively recent date of their origin. The rapidity with which the flowering plants appear and establish themselves in the flora of Upper Cretaceous and Eocene times, the way in which they replace the Gymnosperms, and the striking similarity between the early leaf impressions and the forms of some present-day leaves, are facts which should provide much food for reflection for systematic botanists.

The author (p. 80) states that "from the outline and veins alone an expert is generally able to determine the species to which the plant belongs," but adds: "though it is not always quite safe to trust to these determinations or to draw wide-reaching conclusions from them."

Chapters are devoted to the higher Gymnosperms, Bennettitales and Cycads, the first of these containing a good short account of Ginkgo, the remarkable Maidenhair tree of China and Japan, which, though now only known in cultivation, extended all over the world in Jurassic times. The remains of leaves which are almost identical in outline with those of the modern tree have been found in such different regions as North America, England, Russia, and the Arctic regions.

The past histories of the Pteridosperms, Ferns, Lycopods and Horsetails are reviewed. The author scarcely does justice to the Mesozoic ferns. They are dismissed in a couple of paragraphs, but in reality should stand in a very important place in any account of the past history of the group. Though true ferns may

have been less plentiful in the Palæozoic age than was formerly supposed, there is no doubt that they were among the dominant plants of the Jurassic period.

The author has given a good brief account of the Horsetails, which to-day are so little changed, in many points, from what they were in the time when our coal seams were being formed. It is feared, however, that the next chapter on the Sphenophyllums will be beyond the depth of many readers.

The suggestive concluding chapters raise many debatable points. The author's forecast for the future of plant-form should be of considerable interest to those engaged in studying the variations of modern plants. She thinks that an important group of plants of the future will be so organised that the individual flowers are very simple, with fewer parts than those of to-day, and that they will be combined in communities of highly specialised individuals in each flower head or cluster. At the end of the book there are appendices on collecting and preparing specimens, a short list of literature, and a glossary of botanical terms.

The author is to be congratulated on the interesting way in which she has treated the subject. The plan of the book is admirable, though unfortunately it has been carried out in a rather slipshod manner. Many of the sentences are ambiguous, and some of the facts are stated so that they give a wrong impression. The book should find many readers among botanists in the North or Midlands of England, where fossil plants may be easily obtained from the collieries.

H. H. T.

Plant Life in Alpine Switzerland: being an Account in Simple Language of the Natural History of Alpine Plants. By E. A. Newell Arber, M.A., F.L.S., University Demonstrator in Palæobotany, Cambridge. Illustrated by 48 Plates of Photographs from Nature and 30 Figures in the Text. 8vo, cl., pp. xxiv, 335. Price 7*s.* 6*d.* net. Murray.

It might have been supposed that we had already a sufficiency of books dealing with the alpine flora of Switzerland, for their number is not few, and is continually increasing. But as in other well-filled fields of literature there is often room for a book which should take a position midway between the scientific monograph intended for the expert and the popular—and often incorrect—treatise which is supposed to suffice for the general (and usually very casual) reader, so in this matter of Swiss botany something was required between the excellent but strictly technical "Gremli"– the English translation of which, for some inscrutable reason, is and for some time has been out of print—and the popular books whose attractions lie mainly in their pictures which have from time to time been reviewed in these pages, the latest and one of the best of which we noticed as recently as July.

Every one who goes to Switzerland is struck by the beauty and variety and profuseness of the flowers which meet the eye at every turn; many are so far interested as to dry scraps of them and bring them back to England, possibly to worry their botanical friends for their names; but they are contented with *vox et præterea nihil*, and to many one name is as good and as useful and informing as another. But there are some who would willingly go further if some one would take them by the hand and lead them by a path not too thorny nor too devious into regions of higher knowledge; and Prof. Arber has shown himself a trustworthy guide to such knowledge in the handsome volume now before us. More than that, he is a very interesting one, for his book is thoroughly readable and the promise of "simple language" conveyed by the title-page is honestly carried out; technical terms are only used when necessary—the affectation of omitting them altogether is avoided—and those which are not explained as they occur will be found in the very useful and excellent glossary which forms one of the appendixes.

Some indication of the method and range of the book may be gathered from the headings of the chapters, of which four are devoted to the pastures, one to the meadows, two to high alpine plants and two to alpine thickets and forests; a chapter on adaptations and one in which the geographical distribution, affinities, and origin of the flora are discussed bring the volume to a close, save for the glossary already mentioned, an account of some of the books relating to the flora, and a very useful chapter, with illustrations, on the structure of the flower. In the descriptive chapters the plants are as far as possible treated in natural groups.

The author tells us in his preface that the book is "not intended to give any aid towards ascertaining the names of alpine plants," but, whatever his intention may have been, it certainly does so, not only in the text but by the admirable plates from photographs which diversify the pages. His aim, however, is of course to illustrate the life-history of the plants; and in this he has been notably successful. An extract will give a better idea of his method than could be furnished by any description; we take at random that on the Spider's-web and Mountain Houseleeks (*Sempervivum arachnoideum* and *S. montanum*), somewhat abridged for purposes of citation:—

"When the seed germinates on the primitive soil of some freshly exposed rock, a little rosette of leaves is first formed. The next step is the formation of a colony of such rosettes. This is done by means of what are termed runners and offsets, quite like those of our ordinary garden strawberry plants. From the parent plant, in the axil of one of the leaves of the rosette, a thin prostrate stem is put out which grows for some little distance along the surface of the rock. At or near its end a second rosette of leaves is formed, which in turn produces other runners and offsets. If we remove from the soil a colony [of *S. montanum*] we shall have no difficulty in making out the runners and their offsets.

In most cases where these plants grow on flat-topped rocks with plenty of room all round, the runners are very short and new rosettes or buds are found close to the parent, and so a very compact colony is produced. It is thus scarcely possible, unless the plant is removed from the soil, to make out the relationships of the colony. The runners connecting the rosettes will be found to persist for a long time, and tend to bind the individuals of the colony together as a whole. Compactness of growth, which is here well illustrated, is characteristic of many alpines. The cushion plants and the carpet plants are equally compact, though entirely different in habit. The compactness of the colony, cushion or carpet, tends to reduce to a minimum the risk of intrusion of other plants into the colony. . . .

"The photographs show two colonies of the Mountain *Sempervivum* growing in the crevices of an old wall bounding a meadow near Saas Fee. For a time the plants have been quite at home, but now the necessity for further space to accommodate the growing colony has become pressing. We notice that the colony is no longer compact. We can now see the runners, which are very much longer than they are under normal circumstances. Each bears a few small leaves, and ends in a rosette-bud or offset. The runner arises in the axil of a leaf of the parent rosette.

"We notice in the photograph on Plate xxii. the crowded nature of the rosettes, and further that the whole colony is tilted upwards on its side to face the light. For this reason, some of the runners appear to be shooting straight up into the air. As a matter of fact, this is merely due to the circumstance that the rosettes are tilted through a high angle and the runners are always produced at right angles to the rosettes. Other runners are growing over the sides of the lichen-covered rocks, and on the right-hand side of the picture two runners are seen going round the corner, as it were, to another crevice to seek 'fresh woods and pastures new.'

"In the photograph on Plate xxiii. a colony is seen boldly letting itself down over the face of the rocks from ledge to ledge. The runners seen on the left-hand side are obviously creeping or marching downhill. On the right, the plant, by means of its enormous elongated runners, has as it were made a ladder of itself and is descending over the miniature precipice" (pp. 100–102).

The index is the only part of the book which calls for criticism; it is astonishing how few folk know how to make one! It contains no references to the plates, which appear in a separate detailed list arranged numerically at the beginning of the book and are thus by no means easy to find; and the method of cross-reference is surely foolish—why should we be told "*Habenaria viridis*, R. Br., see the Frog Orchid," when the page might more easily have been given and the trouble of cross-reference avoided? Moreover, the information is misleading, for if you look for "Frog Orchid," you don't find it, for it is under "Orchid, Frog." And

what can be the gain of giving in italics the Latin names of seven Androsaces, followed by their English equivalents, and a cross-reference to each—which is indexed in Roman type—thus

"*Androsace charpentieri*, Heer, see Charpentier's Androsace.

"Androsace, Charpentier's, 182."

We are sorry to see this prominence given to "English" names which no one ever uses—*Androsace obtusifolia* is at least as easy to remember as "Obtuse-leaved Androsace"—and we regret that the generally-accepted spelling of proper names with a capital letter is ignored throughout.

Such books as this are a pleasant indication that the study of plants as a whole is superseding that minute investigation of fragments of them which at one time seemed in danger of taking the place of more general and, we think, more useful knowledge. Mr. Squeers's methods of education were in many respects by no means up to the modern standard, but he taught botany—although his spelling of the word was not that generally accepted—on a thoroughly sound principle. "When a boy has learned that bottiney means a knowledge of plants, he goes and knows em," and the fact that he acquired his knowledge by weeding the garden was a foreshadowing of what we now call ecology.

Anatomy of the British Carices. By FRANCIS C. CRAWFORD. Large royal 8vo, gilt tops, pp. xiii, 124, with twenty Plates. Edinburgh: Oliver and Boyd. 1910. (Printed for private circulation.) 7*s.* 6*d.* net.

THERE is a certain fitness in my being asked by the Editor to undertake a review of this treatise, as I collected a large number of the specimens upon which it is based; on the other hand I have no experience in microscopic analysis or photography, and am therefore not well qualified to deal with the more technical side of the subject.

A short biographical sketch by Mr. A. J. Pressland, an introductory preface by Professor I. Bayley Balfour, and the author's own introduction (dated March, 1907) precede the body of the book.

Mr. Crawford was born at North Berwick on August, 1851, and died suddenly at Edinburgh in February, 1908; the proof-sheets were received on the day of his funeral. After studying at the Edinburgh Academy he was in business for some years in that city, and afterwards (with his brother) on the London Stock Exchange, retiring with a comfortable competence at the age of forty-five. From that time he devoted himself to natural science, more especially geology and botany, and did much useful work as a voluntary demonstrator at the Royal Gardens, Edinburgh. It was at Professor Balfour's suggestion that he undertook the work now under notice, on the preparation for which, alike in the field and the laboratory, he spared no pains.

Although we corresponded regularly for several years, my only meeting with him was at Dingwall, in the late summer of 1900.

Accompanied by my wife, we spent a long day on Ben Wyvis, only just catching the last train back. Physically he was one of the finest men I have ever seen, dressed in the appropriate "garb of old Gaul," just as he is represented in the excellent portrait which faces the title-page. He struck me as being a kindly, genial, large-hearted, unconventional man, doing thoroughly whatever he undertook. An Irish friend has given me most entertaining accounts of his visit with the Scottish Alpine Botanical Club to Killarney, where his commanding personality and somewhat eccentric habits made him a centre of observation. In the evenings his excellent playing on the bagpipes after dinner attracted crowds; in the daytime he went about armed with two formidable flasks of "mountain dew," the contents of which were liberally distributed to all and sundry, so that he soon became very popular in the countryside, especially among the old ladies ("Tut, tut, woman, 'twill do thee good," being his favourite form of persuasion). On one occasion I was much amused by his naive explanation that "he always tried to restrain his language in the presence of clergymen." A person of so much originality lays himself open to some misrepresentation; but those who understand him will be fast friends.

As has been already mentioned, this work owes its genesis to his old schoolfellow, Professor Balfour; I strongly suspect that its exodus is also largely due to him, but he has scrupulously preserved the author's *ipsissima verba*. As he remarks, and I had already inferred, "the real passion of Frank Crawford does not find expression in the book presented. His bump of acquisition was largely developed. From his earliest years he was a collector." All his plants and botanical photographs have been presented to the Royal Botanic Garden at Edinburgh by his trustees.

In his introduction the author has fully acknowledged the help received from various British and foreign botanists, and described his *modus operandi*. It was his original intention to produce a complete monograph of our native sedges, to which the present volume would have been preliminary; but latterly he had paid several visits to the Continent, and was drawn away from his first purpose to the formation of a European herbarium.

On the arrival of fresh specimens, the floral parts were at once photographed life-size; they were then immersed in jars containing spirit. During successive winters transverse sections from the stems, leaves, rhizomes, and roots (if present) were made, and a series of photo-micrographs was taken, the best of which are reproduced on the plates. At a later stage the flowers were dissected, male and female flowers of each species being mounted on glass and in spirit, and photographed *in situ*; these are not figured, as they furnished few new facts. Finally, the stomata were examined, stained, and drawn with a camera lucida and a magnification of about 900 diameters.

Nearly twelve pages are devoted to general anatomy, under the various headings (transverse section of stems, &c.), explaining

in detail the various technical terms used. This is followed by adequate anatomical descriptions of every plant examined, comprising seventy-two species, eighteen subspecies, varieties, and forms, and six hybrids. It will thus be seen that the bulk of our sedges has been dealt with, entirely from British material, with the exception of *C. Davalliana* Sm., which has long been extinct.

The enlarged reproductions on the plates of stem, leaf, and root sections are very clear and beautiful; they should be of good service to future workers.

Mr. Crawford told me that every sedge examined by him presented points of difference from all the rest. In some cases the microscopical work brings out strong marks of affinity with allied species; *e.g.* of *C. Grahami* Boott, which I agree with Pfarrer Kükenthal and Mr. P. Ewing in considering most nearly allied to *C. vesicaria* L., with *C. saxatilis* L. (*pulla* Good.). In the case of hybrids, again, their structure usually shows the influence of both parents pretty plainly; whereas the structural differences between type and variety are, as a rule, inconsiderable.

One point occurs to me as worth raising in this connection. So far as I am aware, in all cases the descriptions have been made from specimens of the same gathering, and practically identical. Some of our species, like *C. inflata* Huds. (*rostrata* Stokes, *ampullacea* Good.), vary much in habit, size, and foliage; in such cases it is probable that the notes on anatomy and the dissections are of less value than those of species which are nearly or quite uniform.

The printing, paper, and binding are all excellent, and the proofs have been carefully corrected. By a slip, *C. punctata* has been attributed to Gunner, instead of Gaudin; *C. lepidocarpa*, again, was described by Tausch as a species, and is retained as such by Kükenthal.

EDWARD S. MARSHALL.

Agricultural Bacteriology. By Professor J. PERCIVAL, F.L.S. 8vo, cl., pp. x, 408. Duckworth & Co. Price 7*s.* 6*d.* net.

THE subject of bacteriology is most commonly associated in the lay mind with animal pathology, and it is not at all generally recognized that bacteria belong to the Plant Kingdom, and that this study in its origin is purely botanical. Its importance from the medical point of view looms so large in the public eye that the part played by these organisms in economic problems has attracted comparatively little attention. To the student of botany, however, this aspect of the question is becoming increasingly important, and a knowledge of bacteriology now forms an essential part of his equipment. Much progress has been made of late in this department of science, especially in relation to practical applications in agriculture and dairy practice, and an English text-book treating of this branch of technical mycology is to be warmly welcomed. Though written in the first instance for agricultural students, it will be of service to all students of botany who aim at a general knowledge of their subject.

The title of Professor Percival's work embraces a wider field than is covered in his text; the term "agricultural bacteriology" would lead one to expect the inclusion of important plant diseases due to bacteria, but these are not touched upon, and admittedly this subject is large enough in itself for the limits of a single text-book.

The book is mainly intended for students who already have a good knowledge of laboratory practice and of the principles of biochemistry. To such the author's plan of giving directions for practical work at the conclusion of the chapters will be found very useful. The scheme is well thought out, and those who follow closely these directions cannot fail to master the technique, and to gain a good practical acquaintance with the elementary principles of bacteriology. The well-devised series of experiments, demonstrating each fact brought out in the text, is one of its most admirable features.

Here and there fuller information seems desirable; for instance, in the description of the use of the autoclave, we are left to suppose that nutrient media sterilized in this apparatus suffer no change during the process. Thus an erroneous impression may be acquired, though the author alludes at a later stage to the changes effected in milk through exposure to high temperatures. It is curious to have mentioned the autoclave in connection with the sterilization of milk. Sterilization by heat in general has its limitations, and a caution would not have been out of place to the effect that certain media are liable to undergo chemical changes when subjected to this treatment. At the end of chapter iii. one misses any practical directions for testing the efficacy of the various substances used as antiseptics. A short chapter dealing with the bacteria in the air might also profitably have been added. The manner in which these micro-organisms vary in number in the different atmospheric strata, and the various circumstances which influence this variation, are important factors which should be realized, and the several methods of estimating the distribution in the air afford a very useful exercise.

A large portion of the book is rightly devoted to the bacteriology of the soil and the important chemical and biological processes which may be included under this head. The author gives a good *résumé* of our present knowledge, and indicates some of the lines upon which valuable research may be conducted in the future. Of special value are the chapters dealing with the influence of bacteria in the dairy. The composition of milk, its characteristic fermentations, the defects and contamination of milk, including the conveyance of disease germs, the manufacture of butter, its aroma and keeping qualities, the influence of the various bacteria in the manufacture and ripening of cheese, are all treated with sufficient fullness to give the agriculturist a good insight into the resources of modern bacteriological science as applied to the problems of the dairy. The instruction throughout is conveyed with a clear, simple directness which will commend itself to all readers.

M. C. P.

Die Aufzucht und Kultur der Parasitischen Samenpflanzen. By Prof. Dr. E. Heinricher. Pp. 1–53, figs. 1–8. Jena, 1910. Price 2 Marks.

In this concise and interesting publication, Professor Heinricher summarizes, particularly from the standpoint of the cultivator, certain phenomena of structure and development in hemiparasitic and holoparasitic seed-plants, selected chiefly from the flora of Central Europe, and belonging to the *Scrophulariaceæ*, *Orobanchaceæ*, *Convolvulaceæ* (*Cuscuta*), *Lauraceæ* (*Cassytha*), *Santalaceæ*, *Loranthaceæ*, and *Rafflesiaceæ* (*Cytinus*). The account is based largely upon the author's personal investigation; the plants described were reared from seed, and the observations covered a considerable period of time. The illustrations comprise eight reproductions from photographs, including some interesting figures of parasites grown in association with definite hosts.

In the opening section, which appears to us to be much too brief—it covers little more than a single page—a few general principles relating to the cultivation of parasitic seed-plants are referred to; nothing new, however, is to be found here. The author then proceeds at once with the types with which he is concerned. Completeness in the latter regard is not attempted; as pointed out in the preface, the forms dealt with are nearly all selected from the Central European flora.

The work is certainly to be regarded as an addition to the literature of biology, but we feel that it might have been expanded with advantage to two or three times its present volume. The elementary student may, perhaps, derive the greatest benefit from its fifty-three pages; but the brevity of the account in the case of many of the types must detract seriously from its value to the practical horticulturist, for whose guidance the publication is primarily intended; while the biologist cannot fail to regret the absence therefrom of general principles and conclusions which must surely have emerged from a series of observations of such undoubted merit.

H. F. Wernham.

BOOK-NOTES, NEWS, &c.

The plan and idea of the second edition of Prof. Ganong's book, *The Teaching Botanist* (8vo, pp. xi, 439, tt. 39, New York, The Macmillan Co., 1910, price 5*s*.), is the same as that followed in the first edition when it was reviewed in this Journal eleven years ago (1899, p. 489). The book has however been rewritten almost throughout, because the author, as he explains in the preface, found that he himself had learned a good deal in the interval, while progress in botanical education in the past decade had been surprisingly great. Great as that progress has been, the author believes that it is little in comparison with that which the coming decade will witness. "I believe," he says, "that the next great wave of botanical interest

. . . will be educational and that it will lift our science into more nearly its rightful place in the life and interests of the community and will leave botanical education a recognized and permanent department of botanical investigation." Prof. Ganong writes from experience gained in the United States of America, but there is no question but that in our own country botany is coming to occupy an increasingly important place in the school curriculum, and it is imperative that those who teach should not only be well equipped with information, but be well advised as to "what botany is of most educational worth"—to quote the subject of Prof. Ganong's second chapter, and as to methods of teaching, equipment, &c. As in the earlier edition, the author insists that for training in observation there is certainly nothing better than the structure of the familiar flowering plants, and that for scientific training generally the best material offered by the science consists in the structure, morphology, and experimental physiology of the higher plants. As in the first edition, the book is divided into two parts. Part i. is entitled "Chapters on subjects important in Botanical Education," occupies rather more than half the text, and includes nine chapters on botany as an educational factor, methods of teaching and equipment; it is full of suggestiveness for the teacher of botany. Part ii., "Outlines and Directions for a Synthetic General Course in the Science of Botany" is primarily designed to provide a guide to the elements of botanical education for those who go no farther with the subject.—A. B. R.

The number (272) of the *Journal of the Linnean Society* published on Oct. 18 contains papers "On *Calamites Scheutzei* Stur, and on the correspondence between some new features observed in *Calamites* and *Equisetaceæ*," by Mr. A. R. Horwood, with two plates; "On Elm seedlings showing Mendelian results," by Dr. Augustine Henry—this should be read in conjunction with the Rev. A. Ley's paper in this Journal for March; why is the "Luccombe Oak" spelt with only one "c"?—with five plates; and on "Male Sterility in Potatoes, a dominant Mendelian character, with remarks on the shape of the pollen in wild and domestic varieties," by Dr. Redcliffe N. Salaman. The part of the *Transactions* published in October contains Miss M. G. Sykes's memoir on "The Anatomy of *Welwitschia mirabilis* in the seedling and adult states," which is illustrated by two plates.

Miss M. C. Knowles and Mr. R. A. Phillips contribute to the Proceedings of the Royal Irish Academy for July an interesting paper on the claim of *Leucojum æstivum* to be regarded as native in Ireland. The history of the plant, both in England and Ireland, is very fully and carefully traced, and the opinion expressed by the Rev. E. Marshall—its discoverer in Ireland—in this Journal for 1898 (p. 49) in favour of its nativity is confirmed by the authors. The paper is accompanied by illustrations from photographs showing the plant *in situ*.

We regret to record the death of Dr. Theodore Cooke, which occurred at Kew on Nov. 5.

INDEX.

For Classified Articles, see—County Records; Obituary; Reviews. New genera, species, and varieties published in this volume, as well as new names, are distinguished by an asterisk.

Acanthaceæ, New African, 250
Adhatoda Eylesii,* 253
African Rubiaceæ, 219; Acanthaceæ, 250
Agrostis verticillata, 80
Alectorolophus, 53, 78, 186
'Algæ Britannicæ Exsiccatæ,' 109; Polymorphism of (rev.), 294
Alpinia formosana,* 325
Anagallis, 237
Anemone Taraoi,* 266
Aquilegia oxysepala var. Buergeriana,* 267
Arber's 'Plant Life in Switzerland' (rev.), 336
Arctostaphylos, 183, 206
Armeria alpina, 278
Armitage, Eleonora, Scottish Bryophyta, 58; Madeira Hepaticæ, 156; Records of Sphagna, 103
Asclepias uvirensis,* 256

Bäck, Linnæus's Letters to (rev.), 290
Bacteriology, Agricultural (rev.), 341
Bailey's Manual of Gardening, 295
Ballota nigra var. membranacea, 115
Barbarea arcuata, 206; stricta, 164
Barclay, W., Note on Rosa, 187, 205; Rosa hibernica var., 332; pimpinellifolia × rubiginosa, 260
Barleria Bagshawei,* 256; paludosa,* 251
Barnes, J. M., 161
Beeby, W. H.† (portr.), 121
Bennett, A., New Potamogetons, 149; Goodyera repens, 258
Berger's 'Stapelieen und Kleinien' (rev.), 293
Berkshire Plants, 195, 233
Beta maritima, 111, 142
Betula alba × tomentosa, 137, 289; tomentosa, 138
'Biographical Index of British Botanists,' 231
Blackwell, Alexander, 193
Bloomfield, E. N., Lecanora mougeotioides, 141
Botanical Exchange Clubs, 58
Botanical Exchange Club Report, 114, 285
Bristol Plants, 16
British Flora, Study of the, 241
British Mycological Society, 215
Britten, J., 'Nomina Rejicienda,' 8; F. B. Forbes, 19; 'Hayward's Botanist's Pocket-Book' (rev.), 61; 'Cronologia della Flora Italiana' (rev.), 80; some Popular Books (rev.), 84; 'Craftsman's Plant-Book' (rev.), 112; Bot. Exchange Club Report (rev.), 114; 'Book of Flowers' (rev.), 143; Surrey Plants, 187; 'Common Weeds' (rev.), 189; 'Subantarctic Islands of N. Zealand' (rev.), 207; 'Nature Study' (rev.), 211; J. B. Carruthers (portr.), 217; 'Biographical Index,' 281; 'Edible and Poisonous Fungi' (rev.), 261; Lathyrus tuberosus, 331; Plant-life in Switzerland (rev.), 336
Britton, C. E., Zannichellia gibberosa, 78; Surrey Plants, 186; Tragopogon porrifolium × pratense, 203; Kalmia glauca, 205; Middlesex Plants, 331
Britton, N. L., Outlawed Generic Names, 110
Brussels Congresses, 223
Bryophyta, Scottish, 57
Bucknall, C., Bristol Plants, 16; Lepidium heterophyllum, 162
Bunting, R. H., 64

Callitriche intermedia var. tenuifolia, 111, 202

Callitris, 118
Calymperes Fordii, 307; tortelloides,* 306
Campanula rotundifolia, 76
Campylopus Sedgwickii (t. 508), 303; Walkeri, 304
Canthium Kitsoni,* 220
Carex, abnormal, 56, 80; acuta, 141; canina,* 325; divulsa × vulpina, 100, 143, 163
Carices, British, 98; anatomy of, 339
Carruthers, J. B., on Para Rubber (rev.), 32; death of (portr.), 217
Cerastium arvense var. Andrewsii, 287
Ceratodon conicus, 205
Ceropegia Kaessneri,* 256
Chenopodium Vulvaria, 93
Cheshire Plants, 152
Chilton, C., Subantarctic Islands of New Zealand, 206
Chodat's 'Polymorphisme des Algues' (rev.), 294
Christ's 'Geographie der Farne' (rev.), 263
Christy, M., Lathyrus tuberosus in Britain, 170
Cimicifuga fœtida var. leiogyna,* 268
Colchicum autumnale, 203, 233
Colloderma* oculatum,* 312
Compton, R. H., Abnormal Carex acuta, 141
Cooke, Theodore,† 344
Cotoneaster vulgaris (t. 504), 89
County Records:—
Berks, 55, 163, 195, 233
Brecon, 23, 326
Cambridge, 284
Carmarthen, 327
Carnarvon, 89
Chester, 152, 206, 234
Cornwall, 56, 58, 80, 142, 260, 333
Cumberland, 259
Derby, 110
Devon, 10, 56, 57, 79, 116, 172, 235, 312
Durham, 259
Essex, 170, 285
Flint, 40, 73, 90, 184, 204
Gloucester, 17, 185, 206, 290
Hants, 142, 191, 235, 259
Hereford, 80, 110, 140, 288
Huntingdon, 116
Kent, 23, 56, 188, 234
Lancaster, 111, 205
Leicester, 203
Lincoln, 57, 166, 173, 206, 257, 331
Merioneth, 259
Middlesex, 164, 223, 269, 331
Monmouth, 109, 140, 163, 288
Norfolk, 175, 258
Northampton, 55, 164, 205
Radnor, 163
Salop, 258
Somerset, 17, 79, 141, 284, 288, 333
Stafford, 202
Suffolk, 173, 175, 203, 331
Surrey, 77, 111, 116, 140, 173, 185, 186, 188, 192, 203, 205, 260
Sussex, 141, 164, 174, 259
Westmorland, 161, 163, 164
Wilts, 188
Worcester, 201, 259
Yorks, 79, 111, 142
[*See also* papers on British Oaks, 1, 32; British Elms, 65; British Carices, 99; British Mosses, 102; British Algæ, 109; and Supplement, "The British Roses."]
Cowan, McTaggart, Cochlearia micacea, 334
Crabbea Kaessneri,* 252
Crampton, C. B., Dicranum Bergeri, 23
Cratægus monogyna var. splendens, 18; oxyacanthoides, 18
Crawford's 'Anatomy of Carices' (rev.), 339

Dallman, A. A., Flintshire Plants, 40, 73, 90
Daphne Laureola × Mezereum, 79
Dartmoor Rubi, 312
Davey, F. H., Agrostis verticillata, 80; Malaxis paludosa, 259; Herniaria hirsuta, 260; Erica vagans × cinerea, 333
Davies, J. H.,† 57, 79
Devon Plants, 10
Dicliptera microchlamys,* 255
Dicranum Bergeri, 23
Didymium oculatum, 310
Didymodon Wallichii, 309
Dixon, H. N., Irish Forms of Fissidens (t. 505), 145; F. tequendamensis, 280; Merceyopsis* and Indian Mosses, 297
Don, George, monument to, 240
Drabble, E. & H., Cheshire Plants, 152

Druce, G. C., Festuca maritima, 23; Tilia platyphyllos, 23; Zannichellia gibberosa, 55; N. Devon Plants, 56; Cornish Plants, 55; his 'Botanist's Pocket Book' (rev.), 61, 78; Rhinanthus v. Alectorolophus, 78; British Carices, 98; Salsola Kali var. tenuifolia, 164; Barbarea stricta, 164; Plant Records, 188; Berkshire Plants, 195, 233; Sibthorp's Lincolnshire Plants, 257; Durham Plants, 259; Juncoides pallescens, 260; Middlesex Plants, 269; Spiræa Ulmaria var. denudata, 281; Hieracium carenorum, 285
Dunn, S.T., New Hongkong Plants, 323
Dyschoriste Monroi,* 250
Dyson's 'Children's Flowers,' 120

Elliott, G. F. S., 'Botany of To-day' (rev.), 23
Elms, British (t. 503), 65; seedlings, 167; nomenclature of, 130
Empetrum nigrum, 95
Equisetum Telmateia, 215
Erica vagans × cinerea, 333
Euclea australiensis,* 159
Euphrasia minima, 235
Eurya muricata,* 324

Fawcett, W., Jamaica Orchids, 106
Ferns, Geography of, 263
Festuca arundinacea, 19; maritima, 23
Fissidens crenulatus, 305; exsul* (t. 505 A), 145; rufulus (t. 505 B), 148; tequendamensis, 146; Walkeri, 305; Zippelianus, 305
Flintshire Flora, 40, 73, 90, 184, 204; Rubi, 184
Forbes, F. B.,† 19
Foxglove, Peloria in, 234, 284
Fries, Th., Linnæus's Letters, 63
Fumaria confusa, 17; occidentalis, 58
Fungi, How to Know (rev.), 30; Parasitism in, 119; Edible and Poisonous (rev.), 261
Furneaux' 'Field and Woodland Plants' (rev.), 86

Gaidukov's 'Dunkelfeldbeleuchtung und Ultramikroskopie' (rev.), 214
Galium erecto-verum, 116
Ganong's 'The Teaching Botanist' 343
Gardner, W., The Orme's Head Cotoneaster (t. 504), 89
Gentiana Amarella, 90
Gepp, A., Glowacki's 'Moosflora,' 144; Christ's 'Geographie der Farne' (rev.), 263
Geranium Endressi, 258
Gerard, J., 'Botany of To-day' (rev.), 23
Glowacki's 'Moosflora,' 144
Goode, G., Botanical Exchange Clubs, 58
Goode, R. H., Salicornia appressa, 142
Goodyera repens, 258
Green, J., 'History of Botany' (rev.), 117
Greves, S., Musa Bagshawei* (t. 506), 169
Grimmia anodon, 309

Haig's 'Plant Cell,' 144
Hastings's 'Summer Flowers of the High Alps,' 191
Hatton's 'Craftsman's Plant Book' (rev.), 112
'Hayward's Botanist's Pocket Book' (rev.), 61, 78
Heinricher's 'Parasitischen Samenpflanzen,' 343
Henry on Elm-seedlings, 167
Henslow's 'British Wild Flowers' (rev.), 85
Hepaticæ, Madeira, 156
Herniaria hirsuta, 260
Hieracia, Ross-shire, 135
Hieracium carenorum, 285; rectulum,* 327; silvaticum var. crassum,* 326; sparsidens var. elatius,* 326
Hiern, W. P., Williams's 'Prodromus Floræ Britannicæ' (rev.), 26, 235; Alectorolophus, 53, 185; Flora de Galicia (rev.), 59; Euclea in Australia, 158; Euphrasia minima, 235
Hillhouse, W.,† 105
Holbech, Charles, 232
Hole's Manual of Indian Botany, 240
Holmes's Algæ Exsiccatæ, 109
Holmes, George,† 64
Hongkong Plants, 323
Horwood, A. R., Natural Selection and Plant Evolution, 177
Hymenostomum edentulum, 307
Hymenostylium annotinum,* 308; Shepheardæ,* 307; xanthocarpum, 307

Hyophila subflaccida,* 308
Hyoscyamus niger, 91; var. pallidus, 283

Indian Mosses, 297
Irish Plants, 8, 22, 109, 145, 192, 202, 216, 227, 284, 287, 327, 344; Hand-list of, 216
Italian Botany, Chronology of, 80

Jackson, A. B., Alfred Loydell,† 88; Hyoscyamus niger var. pallidus, 283; his Catalogue of Syon Plants, 296
Jackson, B. D., Linnæus's Letters (rev.), 63, 290; Alexander Blackwell, 193; Uva Ursi, 206
Jamaica Orchids, 106
Johns' 'Flowers of the Field,' 119
Johnson's (A. H.) 'Cultivation of Rubber,' 32
Johnson's (W.) 'Battersea Park,' 192
Juncoides pallescens, 260
Juncus tenuis, 235, 259
Justicia Bagshawei,* 254; toroensis,* 255

Kalmia glauca, 205
Karten and Schenk's 'Vegetationsbilder,' 216
Keeble, F., 'Dunkelfeldbeleuchtung und Ultramikroskopie' (rev.), 214
Knight, H. H., Sphærocarpus californicus, 186

Lang, W. H., Lotsy's 'Cormophyta' (rev.), 83
Larter, C. E., N. Devon Plants, 79; J. H. Davies, 79
Lathræa Clandestina, 79; Squamaria, 164
Lathyrus tuberosus in Britain, 170, 206, 234, 327
Lecanora mougeotioides, 141
Lees's (F. A.) Herbarium, 168
Lepidagathis nemorosa,* 253
Lepidium campestre var. longistylum (heterophyllum), 17, 162
Leucojum æstivum, 344
Ley, A., British Elms (t. 503), 65; Synonymy in Ulmus, 130; South Wales Hawkweeds, 326
Lincolnshire Plants, 166
Linnean Society, 31, 118, 167, 190, 214, 344
Linnæus's Letters (rev.), 63, 290
Lister, G., New Mycetozoa, 73; Colloderma,* 311
Livett, M. A. G., Viola Foudrasi, 163
Long's 'Common Weeds' (rev.), 189
Lotsy's 'Cormophyta' (rev.), 83
Loydell, Alfred,† 88
Luzula pallescens, 188, 260
Lychnis alba × dioica, 333

McNeill's 'Colonsay,' 191
Macowan, Peter,† 64
Madeira Hepaticæ, 157
Maitland's (Miss) 'Book of Flowers' (rev.), 143
Malaxis paludosa, 259
Marrat's Mosses, 102
Marshall, E. S., Daphne Laureola × Mezereum, 79; Viola hirta × sylvestris, 80, 111; Helleborine viridis, 110; Callitriche intermedia var. tenuifolia, 111; W. H. Beeby (portr.), 121; Ross-shire Plants, 132; Carex divulsa × vulpina, 149; Zannichellia gibberosa, 140; Saxifraga Geum × serratifolia, 233; Colchicum autumnale, 233; Anatomy of Carices (rev.), 339
Massee on Parasitism in Fungi, 119; his 'Diseases of Plants' (rev.), 238; his 'Edible and Poisonous Fungi' (rev.), 261
Matricaria Chamomilla, 154
Maxillaria rufescens var. minor,* 108
Medicago lupulina var. scabra, 202
Melampyrum pratense var. purpureum, 288
Melodorum Oldhami, 324; Uonicum,* 323
Melvill, J. C., Geranium Endressi, 258
Mentha alopecuroides, 285
Merceyopsis* (t. 508), 297; angulosa,* 302; angustifolia,* 301; hymenostylioides,* 302; longirostris,* 299; minuta,* 300; pellucida,* 301; sikkimensis,* 301
Merino's 'Flora de Galicia' (rev.), 59
Middlesex Plants, 269, 331
Milford-on-Sea Magazine, 190
Miller, W. F., Peloria State in Foxglove, 284
Mœnchia quaternella, 17
Moore, S. le M., Alabastra Diversa, 219, 250; Berger's 'Stapelieen' (rev.), 293

Moss, C. E., British Oaks (t. 502) 1, 33
Mosses, Marrat's, 102; Lancashire, 111; Scottish, 125; Indian, 297
Musa Bagshawei* (t. 506), 169
Mycetozoa, New, 73
Myosurus minimus, 17

Natural Selection, 177
Nature Study, 211
New Zealand, Subantarctic Islands of (rev.), 206
Newspaper Botany, 168, 216, 296
Nomenclature, 8, 29, 53, 78, 110, 183, 185, 206, 229
'Nomina rejicienda,' 8

Oaks, British (t. 502), 1, 33
OBITUARY:—
Barnes, James Martindale, 161
Beeby, William Hadden (portr.), 121
Carruthers, John Bennett (portr.), 217
Cooke, Theodore, 344
Davies, John Henry, 57, 79
Forbes, Francis Blackwell, 19
Hillhouse, William, 105
Holmes, George, 64
Loydell, Alfred, 88
MacOwan, Peter, 64
Painter, William Hunt, 296
Stabler, George (portr.), 160
Stewart, Samuel A., 216
Treub, Melchior, 296
Orchis maculata var. O'Kellyi, 22

Painter, W. H.,† 296
Parasitism in Fungi, 119
Parker's 'In Wind and Wild' (rev.), 88
Peloria in Foxglove, 234, 284
Pentas decorus,* 219
Percival's 'Agricultural Botany' (rev.), 165; 'Common Weeds' (rev.), 189; 'Agricultural Bacteriology' (rev.), 341
Physarum alpinum,*73; carneum,* 73
Pilopogon Blumii, 304
Plant Diseases (rev.), 238
Plant Evolution, 177
Polygala calcarea, 17
Polystachya minor,* 106
Potamogeton australiensis,* 149; brasiliensis, 150; dissimilis,* 150; Henningii,* 151; semicoloratus,* 150
Potter, M. C. 'Agricultural Bacteriology' (rev.), 341
Price, S. R., Pink hybrid Campion, 333
Psychotria spithamea,* 222; Tutcheri,* 324
Pugsley, H. W., Fumaria occidentalis, 58; Mentha alopecuroides, 285
Pyrus Aria var. rupicola, 288; intermedia, 288; latifolia, 18, 134; scandica, 134, 288

Quercus in Britain, 1; Cerris, 37; intermedia, 5; lanuginosa, 36; Robur, 6; Robur × sessiliflora (t. 502), 34; sessiliflora, 1; synbalanos, 324

Ramsbottom, John, appointed to British Museum, 216
Rankin's 'First Book of Wild Flowers' (rev.), 86
Ranunculaceæ, Japanese, 265
Rayner, J. F., Juncus tenuis, 235
Reid, On early British Plants, 31
Rendle, A. B., 'Nomina Rejicienda,' 8; Jamaica Orchids, 106; Green's 'History of Botany' (rev.), 117; 'Agricultural Botany' (rev.), 165; Musa Bagshawei* (t. 505), 169; 'The Teaching Botanist' (rev.), 343
Reseda lutea, 43
REVIEWS:—
Botany of To-day. G. F. Scott Elliott, 23
Prodromus Floræ Britannicæ. F. N. Williams, 26, 235
Fungi and how to know them. E. W. Swanton, 30
Flora de Galicia. R. Merino, 59
Hayward's Botanist's Pocket-Book. G. C. Druce, 61
Letters of Linnæus. Th. Fries, 63
Cronologia della Flora Italiana. P. A. Saccardo, 80
Cormophyta Zoidogamia. J. P. Lotsy, 82
British Wild Flowers. G. Henslow, 85
A First Book of Wild Flowers. M. M. Rankin, 86
Field and Woodland Plants. W.S. Furneaux, 86
Lighter Studies. J. Vaughan, 87
In Wind and Wild. E. Parker, 88
Craftsman's Plant-Book. R. G. Hatton, 112

Botanical Exchange Club Report, W. Bell, 114
History of Botany. J. R. Green, 117
Book of Flowers. K. Tynan & Frances Maitland, 143
Common Weeds of Farm and Garden. H. C. Long & J. Percival, 189
Subantarctic Islands of New Zealand, 206
Woodlands of England. C. E. Moss, W. M. Rankin, & A. G. Tansley, 209
Plant Life on the Blackboard. J. H. Kelman, 211
Aims and Methods of Nature Study. J. Rennie, 213
Eton Nature-Study, M. D. Hill & W. M. Webb, 213
Dunkelfeldbeleuchtung und Ultramikroskopie. N. Gaidukov, 214
Diseases of Cultivated Plants and Trees. G. Massee, 238
Edible and Poisonous Fungi, 261
True and False Mushrooms. W. G. Smith, 261
Die Geographie der Farne. H. Christ, 263
Linnæus's Leters to Bäck, 290
Stapelieen und Kleinien. A. Berger, 293
Polymorphisme des Algues. R. Chodat, 294
Ancient Plants. M. C. Stopes, 334.
Plant Life in Alpine Switzerland. E. A. N. Arber, 336
Anatomy of British Carices. F. C. Crawford, 339
Agricultural Bacteriology. J. Percival, 341
Kultur der Parasitischen Samenpflanzen. E. Heinricher, 343
Reynolds, B., Lincolnshire Plants, 57
Rhinanthus, 53, 78, 185
Ribes Grossularia, 49
Riddelsdell, H. J., Lathyrus tuberosus, 206
Rogers, W. M., Flintshire Plants, 184; Dartmoor Rubi, 312
Rosa, Note on, 187, 205; hibernica var., 332; pimpinellifolia × rubiginosa, 260
Roses, British (Supplement); Ross-shire, 133
Ross-shire Plants, 132
Rubber Cultivation, 32
Rubi, Flintshire, 184, 204; Dartmoor, 312
Rubiaceæ, New African, 219
Rubus Drejeri, 17; saxatilis, 49
Ruppia rostellata, 334

Saccardo's 'Cronologia Italiana' (rev.), 80; 'Sylloge Fungorum,' 192
Sagittaria heterophylla var. iscana, 116
Salicornia appressa, 142
Salix Doniana, 289
Salmon, C. E., Beta maritima, 111; Scottish Plants, 225; Juncus tenuis, 259; Tragopogon hybrid, 284; Ruppia rostellata, 334
Salsola Kali var. tenuifolia, 164
Saxifraga Geum × serratifolia, 202, 233
Saxton on Widdringtonia and Callitris, 118
Scabiosa Columbaria, 75
Scirpus fluitans, 18
Scottish Plants, 23, 57, 111, 123, 132, 163, 188, 191, 202, 225, 259, 260, 283, 284, 287–289, 332, 334
Senecio Jacobæa, 75
Shenstone, J. C., Lathyrus tuberosus, 327
Shoolbred, W. A., Ross-shire Plants, 132
Smith, A. L., Swanton's Fungi (rev.), 30; Lecanora mougeotioides, 141; Transactions of Mycological Society (rev.), 215; Massee's 'Diseases of Plants' (rev.), 238
Smith's (W. G.) Drawings of Fungi (rev.), 261
Snippendale, John, 142
Sphærocarpus californicus, 186
Sphagna Records, 163
Spiræa Ulmaria var. denudata, 18, 281
Stabler, G.† (portr.), 160
Stelis Schomburgkii,* 107
Stellaria Dilleniana, 223; graminea, 116
Stopes's 'Ancient Plants' (rev.), 334
Stratton, F., The Struggle for Existence, 142; Isle of Wight Plants, 142; Peloria in Foxglove, 234
Swanton's 'Fungi' (rev.), 30
Swiss Plants preserved, 240
Swynnerton's Gaza-land Plants, 190
Sykes on Welwitchsia, 167

Takeda, H., Japanese Ranunculaceæ, 265
Taylor, John, Lathyrus tuberosus, 234
Teucrium Scorodonia, 93
Thalictrum fœtidum var. glabrescens,* 265; minus var. nanum, 265; sachalinense, 265
Thomas, H. H., 'Ancient Plants' (rev.), 334
Thompson, H. S., Zannichellia gibberosa, 140; South Kerry Plants, 227, 284; Armeria alpina, 278
Thunbergia alba,* 250
Tilia platyphyllos, 23
Todd, W. A., Tragopogon porrifolium × pratense, 203
Towndrow, R. F., Carex divulsa × vulpina, 163
Tragopogon porrifolium × pratense, 203, 284
Trail, J. W. H., The Study of the British Flora, 211
Travis, W. G., Ceratodon conicus, 205
Treub, M., death of, 296
Trichopilia jamaicensis,* 107
Tynan's 'The Book of Flowers' (rev.), 143

Ulmus campestris, 131; glabra, 69; major, 71; scabra, 67, 130; suberosa, 131; surculosa, 72, 131; vegeta,* 68
Ulota phyllantha, 57
Uva Ursi or Arctostaphylos, 183, 206

Vaccinium macrocarpon, 77
Vangueria Kaessneri,* 221; nigerica,* 221
Vaughan's 'Lighter Studies' (rev.), 87
Veronica agrestis v. bottesfordiensis, 166; Beccabunga v. argillacea-sicca, 166
Vicia lutea, 48; sylvatica var. condensata, 287
Viola Foudrasi, 163; hirta × sylvestris, 80, 111
Virecta Kaessneri,* 220

Waddell, C. H., J. H. Davies, 57; George Stabler (portr.), 160; J. M. Barnes, 161
'Warley Garden,' 32
Watson Exchange Club Report, 201
Weathers, J., Bailey's 'Manual of Gardening,' 295
'Weeds of Farm and Garden' (rev.), 189
Welwitschia mirabilis, 167
Wernham, H. P., appointed to British Museum, 32, 64; 'Parasitischen Samenpflanzen' (rev.), 343
West, G. S., W. Hillhouse,† 105; Polymorphisme des Algues (rev.), 294
Wheldon, J. A., Ulota phyllantha, 57; Marrat's Mosses, 102; W. Lancashire Mosses, 111; Inverness and Banff Cryptogams, 123
White, J. W., Bristol Plants, 16; Lepidium heterophyllum, 162
Widdringtonia, 118
Williams, F. N., Lathræa Squamaria, 164; Uva Ursi v. Arctostaphylos, 183; Stellaria Dilleniana, 223; Distribution of Holly, 235; his 'Prodromus Floræ Britannicæ' (rev.), 26, 235
Williams, John, 232
Willmott's (Miss) 'Warley Garden' 32
Wilson, A., W. Lancashire Mosses, 111; Inverness and Banff Cryptogams, 123
Wolley-Dod, A. H., S. Devon Plants, 10; The British Roses (excluding Caninæ) (Supplement), 187
'Woodlands of England' (rev.), 209
Woodruffe-Peacock, E. A., Lincolnshire Plants, 166, 206; 'Woodlands of England' (rev.), 209

Zannichellia gibberosa, 55, 77, 141

PRINTED BY WEST, NEWMAN AND CO., HATTON GARDEN, LONDON, E.C.

THE NEW PHYTOLOGIST

A BRITISH BOTANICAL JOURNAL.

Edited by A. G. TANSLEY, M.A., F.L.S.,

UNIVERSITY LECTURER IN BOTANY, CAMBRIDGE.

Assisted by the Staff of the Cambridge Botany School.

Contents of October and November (Double Number). The Inter-Relationships of the Bryophyta. IV.—Acrogynous Jungermanniales (Figs. 44–54), by F. Cavers. An Investigation of a Species of *Saprolegnia* (Plates I. and II.), by A. E. Lechmere. The Leaf of *Colliguaya odorifera*, Molin. (Text-Figs. 19–25), by H. Summers. Note on Certain Intumescences in Roots, by H. V. Davis. The British Association at Sheffield, by R. H. Y. *Notes on Recent Literature.*—The *Cactaceæ* and the Study of Seedlings, by Agnes Arber. The Effect of Heat and Ether on the Respiration and Composition of Potato-Tubers, by D. T. Plant-Animals. Heredity.

Subscription-Price, 15*s. per annum* (*ten numbers*) *post free.*
Price of single number, 2*s.* *Price of double number*, 4*s.*

Published Monthly by the Editor, The Botany School, Cambridge.

---

144 pp. Price 3s. Postage 2d.

THE BRITISH ROSES

(Excluding Eu-caninæ).

By Major A. H. WOLLEY-DOD.

A few copies of this paper have been reprinted from the 'Journal of Botany.'

Price 2s. 6d., Postage 2d.

The Subsection Eu-caninæ of the Genus Rosa

By Major A. H. WOLLEY-DOD.

Demy 8vo, Price 1s. 6d.

Key to Genera & Species of British Mosses

By the Rev. H. G. JAMESON, M.A.

Demy 8vo, 118 pp., Price 3s.

A Supplement to Topographical Botany, Ed. 2.

By ARTHUR BENNETT, F.L.S.

Pp. 32, with 2 Plates, in Paper Cover. Price 2s., postage 1d.

THE BRITISH PANSIES.

By E. DRABBLE, D.Sc., F.L.S.

London: WEST, NEWMAN & CO., 54 Hatton Garden, E.C.

THE BRITISH ROSES

(EXCLUDING *EU-CANINÆ*).

BY

MAJOR A. H. WOLLEY-DOD.

IN a paper published as a Supplement to this Journal in 1908, I dealt with "The Subsection *Eu-caninæ* of the Genus *Rosa*." I now propose to deal with the rest of the British Roses.

As explained in the paper quoted, no two authors agree in their method of classification, and in so far as the general lines which I have adopted are concerned, the classification is a secondary consideration. My object is to collate author's descriptions, with notes from the best available material, leaving a classification to accompany a revision at some later period, when we have brought our knowledge of the genus more on to a level with that of Continental rhodologists.

But as some method is essential, I have temporarily adopted that of Crépin in his "Tableau Analytique des Roses Européennes" (in Bull. Soc. Roy. Bot. Belg. xxxi. p. 66, 1892). Therein he makes six sections of the genus, viz. *Synstylæ*, *Stylosæ*, *Pimpinellifoliæ*, *Cinnamomeæ*, *Gallicæ*, and *Caninæ*; of which *Cinnamomeæ* and *Gallicæ* have no native British representatives, though one or two of each are more or less naturalized.

Crépin (*l. c.*) thus defines his sections :—

1 { Styles agglutinated into a column more or less salient above the disc; upper stipules of the flowering-branches usually as narrow as the middle ones; stems usually sarmentose 2
1 { Styles free, not salient above the disc, the stigmas forming a little subhemispherical head covering the mouth of the receptacle; upper stipules usually broader than the middle ones; stems erect 3

2 { Stylar column slender, equalling the stamens; disc flat or little conical; outer sepals entire, or with small rarely foliaceous lateral appendages; stems sarmentose ..... *Synstylæ*
2 { Stylar column glabrous, usually much shorter than the stamens, sometimes almost none; disc usually very conical; sepals with numerous very conspicuous appendages; upper stipules narrow, or scarcely dilated: stems a little sarmentose at the summit *Stylosæ*

3 { Sepals all entire, rising immediately after flowering, and usually persistent until the decomposition of the receptacle 4
Outer sepals furnished with conspicuous lateral appendages 6

4 { Inflorescence always one-flowered, the peduncles ebracteate at base; upper stipules narrow, with abruptly dilated very divergent auricles; middle leaves of the flowering-branches often with 7 to 9 leaflets; receptacle in fruit usually of a blackish red when quite ripe, with a violet juice ..... *Pimpinellifoliæ*
Inflorescence often many-flowered, the primary peduncle usually bracteate at the base; upper stipules dilated with erect or little divergent auricles 5

5 { Flowering-branches unarmed or densely setigerous, or with the prickles regularly geminate under the leaves ..... *Cinnamomeæ*
Flowering-branches prickly, the prickles not regularly geminate ... 6

6 { Middle leaves of the flowering-branches 5-foliolate; flowers large, usually solitary and ebracteate; stem with hooked prickles usually intermixed with glandular acicles ..... *Gallicæ*
Middle leaves 7-foliolate; inflorescence usually many-flowered, bracteate ..... *Caninæ*

It will be seen by the above how very general the characters are by which the sections are distinguished, and a close study of the sections themselves will show how unstable they are. Excluding the non-British ones, the most marked is the *Pimpinellifoliæ*, but as hybrids with at least three out of the four subsections of *Caninæ* are not infrequent, a clear distinction becomes obscured. The connection between the other sections will be dealt with under each.

SECTION I. SYNSTYLÆ.

This section, so far as British species are concerned, consists of a single group, namely, *R. arvensis*, which is not liable to great variation, and which is, as a rule, easily recognized. Apart from a distinct habit, by which its members can in most cases be distinguished at a glance, the very long, glabrous, quite connate style-column will almost invariably mark it off. The style-column of the *Stylosæ* is rarely as long, or is often quite short or even none, and the connation is usually much less perfect. In the *Synstylæ* the sepals are usually quite entire or very slightly pinnate, and peduncles very long and almost always more or less covered with small subsessile or shortly stipitate glands. There are, however, varieties which run very close to the *Stylosæ*, rendering a clearly defined distinction impossible, so that Déséglise combined them.

GROUP OF ROSA ARVENSIS.

This, as has already been stated, is a tolerably natural and well-defined group, at least in its British forms, but on the Continent a subgroup of such species as *R. conspicua* Bor., *R. rusticana* Déségl., and *R. dibracteata* Bast. forms a connecting-link in habit and other characters with the *Stylosæ*, and they are often regarded as hybrids therewith. It is doubtful whether we have the true

R. dibracteata Bast. in Britain, but this point will be dealt with in its proper place.

KEY TO BRITISH SPECIES.

1 { Stems more or less thickly clothed with small acicles as well as larger scattered prickles ..... *R. gallicoides* Déségl.
  { Prickles scattered, uniform or nearly so 2

2 { Stems tall, stout and stiff; leaflets large, acuminate *R. dibracteata* Bast.
  { Stems short, weak or trailing; leaflets medium or small, acute or obtuse 3

3 { Peduncles smooth ..... *R. erronea* Rip.
  { Peduncles finely glandular 4

4 { Leaflets fully biserrate ..... var. *biserrata* Crép.
  { Leaflets uniserrate or only very finely and obsoletely biserrate 5

5 { Petioles considerably glandular ..... var. *scabra* Baker.
  { Petioles eglandular or very nearly so 6

6 { Leaflets elliptical; fruit ellipsoid ..... *R. ovata* Lej.
  { Leaflets oval or broadly so; fruit suborbicular or ovoid *R. arvensis* Huds.

ROSA ARVENSIS

Hudson, Fl. Angl. p. 192 (1762).

"Globose fruit and peduncles glabrous. Stem and petioles prickly. Flowers subcymose."

There has been a tendency on the part of some Continental botanists to restrict Hudson's name to the rare form of the species which has eglandular peduncles, on account of Hudson having described those organs as glabrous, but to judge from the descriptions of early botanists, such things as stipitate glands or hairs were disregarded unless they were present in considerable quantity or were very conspicuous. Moreover, the smooth peduncled form is extremely rare in Britain, and is not likely to have been selected as the subject of Hudson's description. Still it must be admitted that it is exceedingly vague, and will readily cover several species of the section *Caninæ*.

Those botanists who hold the above view regard our common British form as *R. repens* Scopoli, Fl. Carn. i. 355 (1772), described thus:—"Stems long creeping, leafy. Calycine leaves alternate, subpinnate. Fruit subrotund. Leaves trijugate, the impair equal. Peduncles 1–3-flowered, villous, hairs red, capitate. Petals white. Fruit glabrous." The view that Hudson's species should have smooth peduncles is, however, losing ground, and the modern one is to regard it as the type, with glandular peduncles, Scopoli's species being merely a weak form.

R. arvensis is recognizable by its trailing habit, its long flaccid stems being densely interwoven into an impenetrable thicket. They are usually glaucous and very often purple, the prickles being few but stout and hooked on the main stem, much smaller and finer on the branches. The leaflets are usually oval and sub-obtuse, but, as in all roses, a large range of variation in shape and colour may be found. They are always coarsely simply serrate.

Sometimes the teeth have one or two sessile glands on their edges, making them appear biserrate, but they are not really so. The midribs beneath are very often hairy, but seldom the secondary nerves. The petioles are usually more or less villous, but rarely prickly or glandular. The peduncles are very long, solitary or in small clusters. They always bear sessile or shortly stipitate glands which do not extend to the fruit. The latter is globose in the typical form, but varies somewhat. The styles are always completely united into a very long glabrous column. The petals are pure white with yellow claws, and the anthers are conspicuously yellow.

It is a very common plant in England, perhaps our commonest species of the whole genus. Mr. Baker says it becomes rare in the north, and is very rare north of the Tweed. It is certainly very abundant in Cheshire.

R. ARVENSIS var. SCABRA

Baker ex Gandoger in Decades Plant. Nov. i. p. 26 (1875).

"Prickles numerous, hooked. Leaflets coriaceous, rigid, nerved, broadly obovate, acute, rounded at base, smooth except the glandular-subglabrous midrib beneath, simply serrate. Petioles prickly, minutely hairy, strongly glandular-muricate. Stipules glandular on the back. Peduncles hispid. Calyx-tube smooth, obovate oblong. Styles coalesced into a glabrous column beyond the disc. Fruit small, obovate, constricted at apex.—Differs from *R. repens* in the form of its leaflets, glandular petioles, &c."

Gandoger actually described this plant under the name of *R. Briggsii* (misspelt *Brippii*), quoting var. *scabra* Baker as a synonym, but as it is hardly distinguishable, even as a variety, it seems absurd to keep it up as a species.

It seems to be distinguished solely by its more glandular petioles, and is not included in Continental lists. I only retain it as it was founded on British specimens, several of which, collected by Briggs in South Devon, are at Kew. It is probably generally distributed.

ROSA OVATA

Lejeune, Fl. Spa, p. 312 (1811).

"Stems very prickly, with hooked prickles. Leaflets oval, glabrous, almost simply dentate, petioles prickly, a little glandular. Peduncles branched, very glandular. Fruit oval, glabrous. Styles glabrous, in a column. Flowers white."

This covers the forms of *R. arvensis* Huds. with ovoid, or, as later authors describe it, ellipsoid fruit, and oval or elliptical leaflets. No line can be drawn between it and *R. arvensis*, which may sometimes have suborbicular leaflets and ovoid fruit, or elliptical leaflets and globose fruit; but, to judge from specimens and modern descriptions, the form of the fruit is more important than that of the leaflets.

To judge from the number of examples in Déséglise's herbarium,

this is one of the commonest segregates. His specimens vary greatly in size and stoutness. Their leaflets are always more acuminate, but not necessarily narrower than in *R. arvensis*. The fruit is always ovoid or oblong. There are British examples from Mr. Baker, collected at Weston, N. Yorks, also from Messrs. Groves, collected at Ashstead, Surrey; and Mr. Brown says, in Suppl. to Eng. Bot. ed. iii. p. 159, that Déséglise has referred here specimens from Malvern, Worcester; Knighton Heath, Devon; and Chetnole, Dorset. I suspect that much of our *R. dibracteata* belongs here.

Rosa arvensis var. biserrata

Crépin, Bull. de l'Acad. Roy. de Belg. p. 113 (1862).

"Leaves with compound teeth (2-3-dentate)."

This is the first notice of any biserrate variety of *R. arvensis* that I have been able to find. Crépin does not mention it, nor any other biserrate form, in his Prim. Monog. of 1869, nor in his Tableau Analyt. of 1892, but in 1880 Boutellier published in Bull. Soc. Bot. de Fr. xxvii. p. 298: "*R. reptans* Crép. Stem slender prostrate. Leaves glandular-bidentate." Whether Crépin meant this to be different to his var. *biserrata*, or to raise the latter to specific rank, I cannot say. Déséglise does not mention any biserrate forms, and I have seen none in his herbarium. Keller retains the name *biserrata* Crép., and says that isolated examples may be found wherever the species exists.

The only example I have seen is one collected by W. R. Linton between Egbaston and Hollington, Derby. It is labelled *R. arvensis* var. *reptans* Crép., and has fully biserrate leaflets, quite glabrous beneath. The stem is weak, and has more numerous but smaller and straighter prickles than is usual in *R. arvensis*.

Rosa erronea

Ripart ex Crépin, Prim. Monog. in Bull. Soc. Roy. Bot. Belg. viii. p. 257 (1869).

"Peduncles smooth. Petioles not or very rarely glandular."

The above description appears to be the only one published, and is merely the first line of Crépin's key, by which he separates *R. erronea* from the other segregates. It may be taken to cover all the varieties of *R. arvensis* which have eglandular peduncles. All I have seen in Déséglise's herbarium have small leaflets and eglandular petioles, which are also almost always glabrous, but Mr. Baker's Scawton (N. Yorks) specimen, the only British one I know, has the petioles pubescent and its peduncles not quite eglandular, so it is not quite typical.

Rosa gallicoides

Déséglise, Cat. Raisonné, p. 49 (1876).

"Habit and general characters of *R. arvensis*, from which it differs by having its stems *covered at the top with fine violet*

stipitate glands mixed with the prickles, these glands are also found on the barren shoots; the leaflets are *larger*, oval-elliptical, those of the young shoots lanceolate or less cuspidate at the apex, the full-grown leaflets coarsely toothed with open teeth, some of them bearing *small denticles*. Peduncles solitary or 2–3 together, covered with fine violet glands, with oval cuspidate bracts, glabrous above, *glandular beneath*, shorter than the peduncles. Calyx-tube small, violet-pruinose, *obovoid*, with fine glands at the base. Sepals appendiculate, gland-fringed, salient in bud, much shorter than the corolla. *Flowers large*. Styles united into a slender glabrous column, from a conical salient disc. Fruit *elongate-ovoid*, red."

This species was originally described as a variety under the name of *R. stylosa* var. *gallicoides* Baker in Monog. Brit. Roses, p. 240 (1869), in terms very similar to those of Déséglise, but as all modern authors now consider it to be a variety or subspecies of *R. arvensis*, Baker's name cannot stand. Déséglise quotes Baker's variety as a synonym, but according to Keller there are quite a number of allied plants, viz. *R. gallicoides* Déségl. as a subspecies of *R. arvensis*, together with three varieties or minor species, also a considerable series of hybrids between *R. gallica* and *R. arvensis*, which appears to dispose of the idea that our plant is one of the latter.

The original station for Baker's variety, on which Déséglise's species was founded, is Chesterton Wood, Warwickshire, but Mr. Bagnall, who first gathered it, says in his Flora of that county that besides *R. stylosa* var. *gallicoides* there exists "a setose glandular form [of *R. dibracteata*] nearer typical *arvensis*, by Chesterton Wood. This variety I have called *R. setosa* on my herbarium specimens." A note on one of his specimens of *R. setosa* says: "The bushes are arched and scrambling, not at all prostrate, and appear to me to be the typical plant [*R. arvensis*] with setose stems, a hybrid between *arvensis* and *spinosissima*, as this grows near; *R. gallicoides* being, as I think, a hybrid between *bibracteata* and *spinosissima*, typical *bibracteata* growing in the same hedge."

It is very doubtful whether there are two plants. Specimens of *R. setosa* Bagnall have been referred by Crépin and others to *R. gallicoides* Déségl., and in the specimens I have seen of the two, the difference is no greater than in the individuals of any species. A specimen from Chesterton Wood, said by Mr. Baker to be a variety of *R. arvensis* corresponding to (but by inference differing from) his *R. stylosa* var. *gallicoides* was placed to *R. gallicoides* by Déséglise.

Specimens from Chesterton Wood labelled either *R. setosa* or *R. arvensis* var. *setosa* have the stems, especially towards the ends, more or less densely covered with very short but rather stout glandular acicles or subsessile glands, so that they are scabrous, rather than aciculate as in *spinosissima* hybrids, and the main prickles, which are longer and less stout than in *R. arvensis*, are quite distinct from the acicles. The leaflets are rather broader

than in *arvensis*, and have the same coarse toothing, but there is a decided tendency to biserration. The petioles are densely glandular, the glands not extending to the glabrous or slightly hairy midribs. The peduncles are very densely covered with fine almost sessile glands. The fruit varies from subglobose to ovoid, and is often somewhat glandular.

Examples labelled *R. stylosa* var. *gallicoides* Baker differ slightly but not essentially. Their main prickles are more numerous, stouter, and hooked, and the minor armature is often less dense. The leaflets are longer and more acuminate, and the fruit more elongate than in *R. setosa*, but every intermediate appears to exist, and although these features lend colour to the suggestion that there may be two plants, an equally great or even greater range is covered by foreign examples of *R. gallicoides* Déségl., and it is most probable that only one species exists.

I have seen specimens from Chesterton Wood, Warwick; Brailsford, Stydd, and Ashbourne, Derby; and near Malvern, Worcester.

Rosa dibracteata

Bastard in DC. et Lamark, Fl. de Fr. v. p. 537 (1815).

"This beautiful species resembles in its habit *R. sempervirens* and *R. moschata* but differs obviously in its styles being united into a glabrous not a hispid column, thus approaching *R. arvensis* and *R. prostrata*, but it is distinguished from them by its size and straight stem. The lower branches are somewhat prostrate and have smaller and paler leaflets, the middle branches are erect, prickles scattered, a little hooked, much enlarged at the base, petioles with very short prickles, leaflets glabrous, oval, pointed, simply serrate. Flowers rosy white, large, in a corymb. Peduncles with very small, scarcely visible, glandular hairs; those of the central branches have two oblong acute opposite bracts at their base; these bracts are wanting in the lower branches."

The name is spelt *dibracteata* in the work quoted, and the older specimens are usually so labelled, but *bibracteata* is the spelling usually employed. I fear the rules of nomenclature compel us to adopt Bastard's bilingual name. Bastard's own name is spelt "Batard" on the title-page of his Essai sur la Fl. du Dep. de Maine et Loire, 1809, but the spelling "Bastard" has been adopted since at least 1815, even, I believe, by himself.

Déséglise, in Ess. Monog. p. 59 (1861), thus describes it:—"Shrub with straight branches, of a glaucescent or violaceous green, prickles scattered, short, dilated at the base, a little arcuate at the tip, often reddish; petioles pubescent, a little glandular, prickly beneath; leaflets 5–7, oval, pointed, firm, nerved, glabrous, shining above, paler beneath, simply serrate, all petiolate, the terminal rounded at the base; stipules glandular on the edges, with straight auricles; peduncles in a corymb, sprinkled with very fine violaceous glands, and furnished with one or two opposite oblong acute glabrous bracts shorter than the peduncles; calyx-tube ovoid, glabrous, or sprinkled with short glands; sepals entire,

some a little pinnatifid, oval, appendiculate at the apex, more or less sprinkled with glands, tomentose within, shorter than the corolla, reflexed and deciduous; styles combined or collected into a glabrous column; flowers rosy-white or white.—This species, by its habit, resembles *R. sempervirens*, but differs in its deciduous leaves, and its styles combined into a glabrous not hispid column; by this last character it approaches *R. prostrata*, but is distinguished therefrom by its straight stem, pubescent and somewhat glandular petioles, and deciduous leaves pale beneath."

Crépin regards Bastard's species as a *sempervirens* × *arvensis*, and Rouy and Foucaud as a *sempervirens* × *stylosa*. Keller, however, in Asch. & Graeb. Fl. Mitt. Eur., treats it as one of the stout, suberect subspecies of *R. arvensis*, associating it with *R. conspicua* Bor. and *R. rusticana* Déségl., while *R. sempervirens* × *arvensis* with three varieties is retained as a group distinct from *R. dibracteata*, &c., characterized by little else than more persistent leaves and usually more or less hispid styles. The last-mentioned character, though apparently not invariably present, is of great importance in indicating the *R. sempervirens* parentage, that species having hispid styles. Bastard distinctly says the styles of *R. dibracteata* Bast. are glabrous, which seems to dispose of Crépin's hybrid theory. This leaves Bastard's species as a stout, suberect bush, with shining thicker leaflets and usually more numerous flowers, which characters indicate nothing but a very strong state or variety, though it must be admitted that the better marked examples look very different from those at the other extreme of *R. arvensis*, and I think it deserves retention at least as a variety.

There are three of Bastard's own gathering at Kew. The prickles are very stout-based and hooked but not large. The leaflets are large, somewhat obovate or broadly elliptical, coarsely serrate, quite glabrous beneath, but the petioles densely, very finely pubescent, with a few scattered glands and small prickles. The flowers are 4 to 5 in a panicle rather than a corymb, and the peduncles spread rather more than in *R. arvensis*. The fruit is too young to show its shape, and the styles cannot be seen. The sepals and peduncles are more glandular, and the sepal pinnæ somewhat larger than in *R. arvensis*.

Déséglise admits British examples from Longbridge, Revelstoke, and the Plymouth-Yealmpton Road, S. Devon, also from Burraton St. Stephen's, E. Cornwall; Tiptree, Essex; Thirsk, N.E. Yorks; and one labelled *R. systyla* by Woods from some unnamed station in Sussex. As a large stout form of *R. arvensis*, showing some approach to, though quite distinct from, *R. systyla* Bast., it is probably generally distributed. *R. arvensis* var. *major* Coste is a later name, and perhaps more free from ambiguity.

Foreign Species of the Group of R. arvensis.

The two best known foreign members of this group, either of which might occur in Britain, are *R. conspicua* Bor. and *R. rusticana* Déségl.

The first-named is regarded by Rouy as another form of the *R. sempervirens* × *stylosa* hybrid, while Keller regards it as a variety of *R. dibracteata* Bast. under *R. arvensis*, distinguishing it mainly by its dull leaves and subglobose fruit. Specimens seem almost indistinguishable from the best developed form of Bastard's species, but the loose and often hairy styles lend colour to the hybrid theory. Its prickles are usually straight and stout.

R. rusticana Déségl. comes even nearer to *R. stylosa*. Rouy regards it as a *R. arvensis* × *stylosa* hybrid, while Crépin and Keller regard it as a variety of the last-named species. Keller, however, admits that he mistook for *R. rusticana* Déségl. a dwarf, but stout and erect variety of *R. dibracteata*, which he now calls *R. pseudo-rusticana* Kell. non Crép. If Déséglise is to be believed, Keller's mistake seems more likely to be the other way, but the species is at best an ambiguous one, and undoubtedly makes a close approach to *R. stylosa* in its numerous very stout and hooked prickles, large leaflets, though quite glabrous beneath, peduncles several, sepals moderately pinnate, fruit large ovoid, and, above all, by its short loose styles on a very conical disc.

SECTION II. STYLOSÆ.

This section is regarded by Déséglise as a subsection of the last, but both Rouy and Keller make it one of the aggregate species of the subsection *Eu-caninæ* of the *Caninæ* section. As it occupies an intermediate position between the two it is perhaps best to follow Crépin, who makes it an independent section. It contains one aggregate species only, viz. *R. stylosa* Desv.

GROUP OF ROSA STYLOSA.

This group in technical characters runs very near that of *R. arvensis* on the one hand, being connected therewith by *R. dibracteata*, *R. rusticana*, &c., and on the other runs near some of the *Eu-caninæ*, through *R. leucochroa*.

Generally its members may be recognized by a stout, erectish habit, with very stout, broad, hooked prickles, dark shining green rather long acuminate leaflets, stipules not much enlarged towards the ends of the branches, long weakly hispid peduncles, conspicuously conical disc, glabrous styles either united into a column, shorter than that of the *arvensis* group, or quite often only collected into a loose fascicle, when they do not differ from many *Eu-caninæ* species, but the stigmas are always arranged either in a conical or a cylindrical head, not a hemispherical or flattish one as in the *Eu-caninæ*. Exceptions, however, occur to all these characters, as they do in all groups. The best known of these aberrant forms in Britain is *R. leucochroa* Desv., which might be taken for one of the varieties of the *R. dumetorum* group, near *R. Deseglisei* by those who do not know the *Stylosa* group well. This, however, is a local species, though abundant where it does occur, and the bulk of the members of the group are easily recognized.

Key to British Species.

1 { Peduncles glandular hispid 2
  { Peduncles smooth 6

2 { Leaflets hairy above, and rather densely so all over beneath. Flowers white ..... *R. stylosa* Desv.
  { Leaflets glabrous above, hairy on nerves only, or glabrous beneath 3

3 { Leaflets small, often with remarkably long acuminate apex, very sharply serrate. Flowers white. Fruit globose... var. *evanida* Christ.
  { Leaflets not so. Flowers white 4
  { ,, ,, ,, Flowers rose 5

4 { Branches very long, arcuate-prostrate. Leaflets pale green, very coarsely deeply toothed, subglabrous on midrib. Disc very prominent ..... var. *pseudo-rusticana* Crép.
  { Stiff, erect. Leaflets small, dark green, toothing not coarse, midrib usually hairy. Disc flattish; styles short ... *R. leucochroa* Desv.

5 { Leaflets oval-elliptical, acuminate. Fruit ovoid ... *R. systyla* Bast.
  { Leaflets elliptical-lanceolate. Fruit subglobose var. *lanceolata* Lindl.

6 { Leaflets quite glabrous both sides ..... *R. virginea* Rip.
  { Leaflets hairy all over beneath, and often above var. *corymbosa* Desv.

Rosa stylosa

Desvaux, Journ. de Bot. 1809, ii. p. 317 (1809).

"Calyx-tube ovate-elongate. Peduncles glabrous, subgeminate, rarely umbellate. Leaflets oval, acute, tomentose. Styles connate, elongate. Flowers white."

In Journ. de Bot. 1813, ii. p. 113, he says:—"Styles united into a glabrous column. Three calycine segments pinnatifid. Leaflets with entire teeth, villous beneath. Fruit glabrous oblong. Peduncles glandular.

"β *corymbosa* Desv. (*R. leucantha* Loisel) differs by its glabrous peduncles."

This, being the oldest name in the group, must stand for its typical species, but it is certainly very rare in Britain, and even on the Continent appears to be much rarer than *R. systyla* Bast.

There is a small and weak piece in herb. Déséglise, and another at Kew, both collected by Desvaux. They present the following points. Their prickles are quite small but stout and hooked with thick bases. The leaflets of Déséglise's specimen are elliptical acuminate, equally narrowed at both ends, those of the Kew specimen being oval, acute, not acuminate; they are quite uniformly serrate, conspicuously hairy above and more densely so beneath, petioles densely pubescent, not or scarcely at all glandular but prickly, the prickles of the Kew specimen especially being numerous and very unequal; stipules broad, hairy, not or scarcely gland-ciliate. Peduncles 1 to 4, long, not much glandular hispid. Bracts narrow. Calyx-tube ellipsoid-ovoid; sepals long, pinnatifid, with foliaceous points. Styles glabrous, rather long in Déséglise's, but not so in the Kew specimen, stigmas in a long cylindrical mass, disc very conical.

These specimens, though poor ones, indicate well the salient points of the species, to which should be added white flowers, which, together with the much more hairy, and usually shorter, broader leaflets, distinguish it from *R. systyla*. Herbarium specimens look much more compact, the leaflets especially being closer set than in *R. systyla*. The glands on the peduncles, though stouter and longer stipitate than in *R. arvensis*, are usually less stout than in the glandular peduncled species of the *Eu-caninæ*.

Déséglise has no British specimens labelled *R. stylosa* Desv., but he has confounded it with *R. corymbifera* Borkh., a fact I did not notice when writing my notes on that species in "The Subsection *Eu-caninæ*," pp. 70, 71, though strongly suspected by Mr. Rogers, whose specimens from Bentley Wood, S. Wilts, therein referred to, are certainly *R. stylosa* Desv., with somewhat weaker prickles and rather less glandular peduncles than usual. Briggs's Plymouth example should be referred to *R. leucochroa* Desv., so that *R. corymbifera* Borkh. disappears from our list. Some of the Continental specimens referred to it belong to the *Stylosa* group.

In the British herbarium a specimen from Buckden, Hunts, by W. R. Linton, is correctly labelled *R. stylosa*; also specimens from Puddleton, Dorset, by Mr. Rogers, labelled *R. Desvauxii*, from Wilton, S. Wilts, and from Mottisfont, S. Hants, are *R. stylosa* Desv. Examples from Witley, Surrey, and Ham Street, E. Kent, by Mr. Marshall, referred here with doubt by Mr. Rogers, presumably on account of their white flowers, are much too glabrous, and belong to *R. systyla* Bast.; also I believe those from Weston Mills and Yealmpton, S. Devon, though it is possible that the two latter are subglabrous forms of *R. stylosa*.

R. stylosa var. *Desvauxii* Baker is a synonym of *R. stylosa* Desv., as also is var. *Desvauxiana* Seringe.

Rosa stylosa var. corymbosa

Desvaux, Journ. de Bot. 1813, ii. p. 113 (1813).

(For description see under *R. stylosa*.)

This name is a much older one than var. *opaca* Baker, Monog. p. 240 (1869), which Mr. Baker thus describes:—"Leaves dull, grey-green above, and still more hairy than the last [var. *Desvauxii*], quite three-quarters as long as broad, and rounded at the base. The peduncles shorter and quite naked, the flowers pure white and not much over an inch across, scarcely more than the head of stigmas protruded." I do not think Mr. Baker's name can stand against Desvaux's. The description of the leaflets is exactly that of *R. stylosa*, though they are sometimes long and narrowed at each end, as in *R. systyla*. The variety, therefore, differs only in its smooth peduncles and smaller flowers. The latter, and the length of the style-column, is liable to considerable variation. It cannot, therefore, be held to be distinct from var. *corymbosa* Desv.

I have introduced this variety solely on the strength of Mr.

Baker's type-specimen of var. *opaca*, which is in Borrer's herbarium at Kew. But for the existence of such species as *R. leucochroa* Desv. and var. *evanida* Chr., I should have much doubted this being a *stylosa* form at all. Its prickles, though hooked, as in many *Eu-caninæ*, are slender from shortish bases, the upper ones quite slender and very unlike those of this group. The peduncles are quite short, and the styles are short with the stigmas in a flattish head, just as in the *Eu-caninæ*. It was gathered by Rev. G. E. Smith between Chilgrove and Brooms, Sussex (not Kent as stated in the Monograph), and I have seen no other British specimens referable to this variety.

Rosa systyla

Bastard, Ess. Fl. de Maine et Loire, Suppl. p. 31 (1812).

"Calyx-tube ovate, glabrous. Peduncles hispidulous. Petioles and veins puberulent. Leaflets ovate-lanceolate, glabrous. Flowers solitary. Styles coalesced into a cylindrical column. — Arching shrub with short little-hooked prickles. Petioles prickly, pubescent. Leaflets oval-lanceolate, glabrous, with nerves lightly villous. Flowers solitary. Styles coalesced. Flowers pale rose."

This is quite the commonest and best known species of the group, and, as a rule, quite distinct from any other. In the south-west it is associated with the locally very common *R. leucochroa* Desv., from some forms of which it is not always readily distinguishable, and in its hairier forms is sometimes mistaken for *R. stylosa* Desv.

Its prickles are always stout, even the uppermost, their bases especially being very thick and broad, and the points usually hooked though sometimes straight. This prickle character is a very constant feature of the species, and is almost always present somewhere on the plant, even when a cut specimen does not show it. Similar prickles may be found among the *Eu-caninæ*, but if the other characteristics be taken into account, confusion is not likely to arise. The leaflets are large or rather large, usually longer in proportion to their width than in *R. stylosa*, and well spaced on the petioles; they are sometimes quite narrow lanceolate. The toothing is always simple, and, as a rule, quite regular. They are always glabrous above, and always hairy on midrib beneath, usually also on side nerves, rarely on whole lower surface. The petioles are villous and prickly, often considerably so, with small unequal stout prickles; they are almost always eglandular, but occasionally bear a few scattered glands, which very rarely extend to the midrib. The stipules are usually glabrous except on the midrib. The peduncles are long, and usually in clusters. Bastard says they are solitary, and credits his *R. fastigiata* with clustered flowers, but both forms may be found on the same bush, and clustered flowers are almost always present on the stronger shoots. They are almost always more or less glandular hispid, never densely so, and occasionally one or two may be naked. The bracts are lanceolate, sometimes broadly so,

though seldom so broad as in the *Caninæ*. They are usually shorter than but sometimes as long as the peduncles. The styles are quite glabrous, and usually combined into a column, but are very often free, and though typically long sometimes scarcely exceed the disc. In the *Eu-caninæ* coalescence and considerable protrusion of styles are not infrequent, and such specimens are often referred to the *Stylosæ*, in some cases, I have thought, correctly, but in *R. systyla* Bast., if not always in all the segregates, the disc is very conical, and the stigmas are arranged in a conical or cylindrical not a hemispherical or flattish head. The fruit varies from quite ellipsoid to quite globose, the former being the more frequent. The flowers are usually pale rose, but white-flowered forms occur which have been wrongly labelled *R. stylosa* Desv.

This species has been unaccountably mistaken for *R. andegavensis* Bast. The hairy midribs alone should prevent this mistake, even if the other characteristic features of *R. systyla* are not well-marked.

It is generally distributed in the South of England, from Essex, Kent, and Middlesex to Gloucester and Cornwall, and I have a well-marked specimen from Buckinghamshire, just over the Hertfordshire border near Rickmansworth. I have never seen a specimen north of these limits, but it is reported on good authority from Oxfordshire and Berkshire. It is not I think very common, though often collected on account of its conspicuousness, but I can only speak from my own experience. A specimen labelled *R. systyla* var. *Desvauxii* Baker from Hartwell, Sussex, belongs here, and not to *R. stylosa* Desv., of which var. *Desvauxii* is a synonym.

Rosa systyla var. lanceolata

Lindley, Monog. Ros. p. 111 (1820).

"Leaflets ovate-lanceolate. Fruit spherical."

I include this because it was founded on a British plant gathered in Ireland, of which I have not seen a specimen, but Crépin (Journ. Bot. 1896, p. 179) says the specimen in Lindley's herbarium is a *Micrantha*, so it is doubtful whether the name can stand. The same name has been adopted by De Pronville, a French author, and there are several specimens in herb. Déséglise which appear to be characterized rather by their spherical fruit than by any peculiarity in the shape of the leaflets, though some of the specimens have them narrow-lanceolate. These forms would seem to fall under *R. erratica* Rip. Such forms could, I think, be readily matched in Britain, but I have seen no specimens so named, those which have the leaflets have not always the fruit.

Rosa leucochroa

Desvaux, Journ. de Bot. 1809, ii. p. 316 (1809).

"Calyx-tube ovate elongate, glabrous. Peduncles glandular. Petioles aculeate, tomentose. Leaflets glabrous, ovate elongate. Styles connate, subelongate. Flowers yellowish-white.—Remark-

able for the yellowish tint of its flowers, and above all for a very agreeable and very pronounced smell of musk."

In Journ. de Bot. 1813, ii. p. 113, Desvaux says:—"Styles glabrous, united into a more or less elongate column, sometimes very short. Calycine divisions pinnatifid. Leaflets with entire teeth, veins pubescent. Fruit oblong. Peduncles glandular-hispid. Flowers yellowish white."

Desvaux's figure xv. (*l. c.*) represents a plant practically identical with his figure xiv. of *R. systyla*, but with shorter styles, which are not essential, and with fewer but equally stout prickles.

Mr. Rogers in Report of Bot. Exch. Club for 1888, p. 227, thus describes *R. leucochroa* Desv., which he knows well, and which reaches its greatest frequency in Devonshire, where it is one of the commonest roses. "Fully to justify the application of the name *leucochroa* to any bush, it should have, I think, in combination with a white corolla, a markedly stiff erect habit, peduncles of moderate length, well clothed with setæ, styles nearly or quite glabrous, leaflets just intermediate in size and outline between *systyla* and *obtusifolia*, glabrous above, hairy on the veins beneath, and ciliate, and prickles remarkably hooked (especially on the flowering-shoots), also just intermediate between those of *systyla* and *obtusifolia*. These prickles (usually red) have much longer points than those of *systyla* and *stylosa*, and in conjunction with the stiff habit and rather small obovate leaflets (sharply, simply toothed and usually dark green), make the bush easily recognizable. The fruit is nearly oval, with a disc as prominent as in other *stylosa* forms, and bearing a short style-column after the petals fall. In flower the styles are usually free, and variable in the degree to which they protrude."

I have seen many bushes of his in Devonshire, and can endorse the foregoing except that the prickles should be described as slender for the group, more so than in either *systyla* or *obtusifolia*, but long and much hooked. The disc is remarkable for being so little prominent for the group, much less so than in many of the *Eu-caninæ*, and the styles are usually quite short, the head of stigmas often scarcely showing the characteristic *stylosa*-like form, so that, until one gets to know the species by sight, it might be referred to a *Deseglisei* form. The leaflets are dark shining green, rather or quite small, but often more acuminate than one would infer from Mr. Rogers's notes. They are sometimes almost and occasionally quite glabrous beneath, but the petioles are always pubescent. I have not seen it in flower, so cannot endorse Desvaux's remark about their scent.

There is a specimen at Kew from Desvaux. It is only the end of a flowering-branch and is quite unarmed. Its leaflets are of medium size, acute not acuminate, but it agrees otherwise with the above. A specimen in herb. Déséglise, however, authenticated by Desvaux, is indistinguishable from *R. systyla*, of which it has the prickles, rather large, long leaflets, hairy on nerves beneath, long styles, and conical disc. Desvaux wrote on his

label, "flowers yellowish white," which is the only apparent difference from *R. systyla*.

This species has been mistaken for *R. collina* Jacq. Much of that so labelled from Devonshire belongs here, and Mr. Baker's descriptions of *R. collina*, Seeman's Journ. Bot. iii. p. 52, and in Monog. p. 232, refer to it. It has also been mistaken for *R. Deseglisei* Bor., but that has, or should have, very hispid styles. Possibly Mr. Rogers's specimen of that species from Trusham (*Eu-caninæ*, p. 79) is *R. leucochroa*. Several foreign specimens placed to *R. Deseglisei* by Déséglise, probably correctly, on account of their hispid styles, were labelled *R. leucochroa* by their collectors. The species certainly occurs in S. Hants (very rarely), Dorset, Somerset, N. and S. Devon, and E. and W. Cornwall.

Mr. Rogers has very kindly lent me his series of this species, and has given me some valuable notes thereon. His series appears capable of division into two sets of forms, one of which agrees closely with his description of *R. leucochroa*, but the others run into larger, coarser forms, sometimes with stouter prickles, but always with considerably longer leaflets, *i. e.* longer but narrower in proportion, and more widely spaced, so that the plant has more the appearance of typical *R. systyla*, but with white flowers, short styles, flattish disc, and usually less stout and more uniformly hooked prickles.

Taking everything into consideration, it seems to me that Desvaux intended his species to be restricted to typical *R. systyla* Bast., but with white flowers, and sometimes, though by no means necessarily, shorter styles. He makes no mention of flatter disc. This idea is borne out by Desvaux's description, specimens, and figure. The modern interpretation appears to go a good deal further than this. Our usual Devonshire species is undoubtedly a very well-marked type, so much off the *Stylosa* group that I consider it to be nearer to the *Eu-caninæ*, but Mr. Rogers does not agree with this, though he considers it to make a long step in that direction. Crépin remarks on one of Mr. Rogers's specimens that if we confine ourselves to the character of white flowers for segregating *R. leucochroa*, we get as a result a heterogeneous collection of material, which confirms my idea that we have two segregates in Britain. Except that I deprecate the creation of new varieties without good ground for doing so, I should feel inclined to suggest that the name *R. leucochroa* Desv. be restricted to white-flowered forms of typical *R. systyla* Bast., which would of course mean that it is hardly even varietably distinct. Thus a new name would have to be found for the common Devonshire plant as described by Mr. Rogers. If my view be correct, the Witley and Ham Street specimens, possibly also those from Weston Mills and Yealmpton, referred to on p. 11, would be Desvaux's *R. leucochroa*.

Rosa stylosa var. pseudo-rusticana

Crépin ex Rogers in Journ. Bot. 1889, p. 24.

"Bush strong, with very elongate arcuate-prostrate branches. Prickles few (quite wanting on some stems), *systyla*-like, but

longer-pointed. Leaflets usually quite glabrous, though occasionally having a few hairs along the midrib beneath, pale green, very unequal, strongly acuminate, and with unequal (often *very* unequal) strongly acuminate simple serrations; often tinged with red. Petioles usually rather hairy, with a few small prickles and setæ. Stipules and bracts remarkably acuminate, fringed irregularly with hairs and setæ, but otherwise glabrous, often tinged with red. Corolla cup-shaped, pure white. Sepals as strongly pinnate as in *systyla*. Style-column on very prominent disc, and so made about level with the stamens, though actually shorter. Peduncles always well clothed with unequal setæ, usually shorter than in *systyla*, though longer than in average *canina* forms."

Specimens I have seen at Kew and in the National Herbarium are often almost unarmed, or have few prickles, which are curved rather than hooked, and not stout-based, as in *systyla*—in fact, they do not differ from those of many *canina* forms. The leaflets are usually large, varying from oval to oval-lanceolate, sometimes not more acuminate than is usual in *systyla*, but sometimes smaller, narrower, and very long-pointed. They are remarkable for their very deep coarse toothing, which is often not quite regular, and sometimes in some of the leaflets there is a small secondary tooth between the large ones. They are, as a rule, quite glabrous, and the petioles nearly so, but considerably prickly and a little glandular. The stipules are sometimes very narrow, sometimes rather broad. The peduncles are solitary or few in a cluster, of moderate length, always rather strongly glandular hispid, and the style-column always long, and disc prominent. These last two characters prevent it from being confounded with *R. andegavensis*. Mr. Rogers says its buds are pure white just before expansion, though the fairly large ones are usually pink-tipped, and the fading petals faintly pinkish.

This well-marked species is unknown on the Continent, and is very local in Britain. It has been supposed to be a hybrid between *R. systyla* and *R. arvensis*, presumably on account of its very coarse broad leaf-toothing, and very long style-column. I see no particular objection to the theory, but there are other species of more uncertain position between the two, such as *R. rusticana* Déségl. and *R. conspicua* Bor. It is fairly abundant locally in Dorset and S. Devon, and is found in S. Wiltshire and Somerset. It is reported from Warwick, but this county is very doubtful.

Rosa virginea

Ripart ex Déséglise, "Notes extr. de l'énum. des Ros." in Journ. Bot. 1874, p. 167.

"A robust tufted bush, prickles numerous, dilated at base, recurved at apex, those of the young branches less strong; petioles a little villous at the edge of the furrow and at nodes, some bearing a few small fine stipitate glands, prickly beneath. Leaflets 5 to 7, oval acute, or roundish oval, *glabrous*, green above, paler beneath, simply toothed. Stipules glabrous, gland-ciliate, auricles

acute, divergent. Peduncles 1 to 4, glabrous, having at their base glabrous oval bracts, cuspidate at the apex, equalling or shorter than the peduncles; calyx-tube *obovoid* glabrous; sepals spatulate at the apex, the outer entire, salient in bud, shorter than the corolla, reflexed in flower, deciduous; styles glabrous in a more or less salient column; flowers pure white, even on the claws; fruit red, spherical."

There are two specimens, collected by Ripart, in herb. Déséglise. They have curved, not hooked, prickles on the branches, those on the main stem being straightish, but with the usual *systyla* base. The leaflets are rather small, oval elliptical, acute not acuminate, quite uniserrate and quite glabrous beneath. The petioles are practically glabrous but with fine hairs in the furrow and at the base, eglandular, with many unequal prickles. The stipules are gland-ciliate with rather broad auricles. Peduncles 3 to 4, smooth, rather short, equalling or longer than their bracts. Sepals long, with well-developed pinnæ, eglandular. Styles glabrous, in a short column or subsessile, but stigmas in a cylindrical head, as is usual in the group, though they are loose. The fruit, which is rather young, is small and ovoid.

Other foreign specimens usually have straightish and small but very stout prickles, and small fruit, which is sometimes ovoid, but usually globose. The leaflets are always quite uniserrate.

The authority for the introduction of this species into the British list appears to have been a specimen collected by Messrs. Groves at Horsebridge, S. Hants, but as it has most of its leaflets quite biserrate, the collectors agree with me that it must have been wrongly named by Déséglise. The stems are quite unarmed, the leaflets long and narrow, longly acuminate; otherwise it agrees with the description except in serration. The styles, however, are longer, and sometimes very slightly hairy and the disc more conical than in Ripart's specimens.

There are two other specimens, which Messrs. Groves inform me were gathered in the same neighbourhood. One from Mottisfont was referred by Déséglise to *R. Chaboissæi* Gren., and has been noticed under that species (*Eu-caninæ*, p. 44). The hairy styles remove this from *R. virginea* Rip., which it otherwise resembles. The other specimen is from King's Somborne. It is very like the Horsebridge specimen, but is quite unarmed and has longer leaflets, slightly hairy on the midrib and petioles, and much fewer teeth have secondary denticles. The hairy midribs remove this from *R. virginea* Rip.

If purely technical characters must be followed, none of these specimens can be *R. virginea* Rip., but they do not appear to fit any other named form of the *Stylosa* group. It may be found, and is indeed probable, that the presence of a few hairs on the leaflets, or styles, in a supposed glabrous species, or a slight biserration in an uniserrate one, must be permitted, though whether the Horsebridge plant is not too biserrate is arguable. If this be admitted, the classification of the species and varieties of rose becomes more difficult than ever.

Two other specimens of supposed *R. virginea* Rip. require notice. One by Webb from Bisham Lane, Lancs, referred here by Déséglise, has slender curved, not hooked prickles, flattish disc, short loose puberulent styles, with globose not cylindrical head of styles. Not only are all these features quite opposed to those of the *Stylosa* group, but the geographical situation is very much against its having been correctly named. Briggs's plant from Gawton, Beer Ferrers, S. Devon (Bot. Exch. Club Rept. 1876, p. 17), must be wrongly named on account of its hairy midribs and hispid styles.

I gathered what I believe to be the true plant in S. Devon last year. It has been accepted as correct by M. Sudre.

Rosa stylosa var. evanida

Christ in Bot. Exch. Club Report for 1879, p. 12 (1880).

"Leaflets smaller, biserrate, almost glabrous, but with the hispid peduncles and elongate styles of *stylosa*. The passage from *stylosa* to *canina biserrata*."

Nicholson, its discoverer, adds:—"A somewhat erect bush, 5 to 8 ft. high. Prickles on barren stem $\frac{5}{8}$ in. long, and the scar almost as deep. Leaves of the barren shoots about 4 in. long, with seven leaflets, the terminal one $1\frac{1}{4}$ in. long by about $\frac{5}{8}$ in. broad, hairs nearly confined to midrib and petiole; the serration double, teeth acute. Flowers from 6 to 12 or more in a cluster, the peduncles clothed with weak aciculi and setæ. Calyx-tube globose, naked, sepals little more than $\frac{1}{2}$ in. long. Other bushes from the same locality agree thoroughly in all respects with the exception of their having sepals hispid at the back."

Both the above descriptions are incorrect in attributing biserrate leaflets to this species. I have seen Nicholson's original specimen at Kew, from which Christ's description was drawn up, and have gathered the plant myself on Ham Common. It has such striking peculiarities that there can be no shadow of doubt as to their identity.

The prickles, though large, stout, and hooked, entirely lack the thickened cushion-shaped base characteristic of the group, though in this respect they are not more untypical than those of *R. leucochroa*. The leaflets are medium to small, oval or elliptical, often remarkable for a long cuspidate or acuminate entire apex, which might sometimes be described as caudate, such as I have seen in no other rose. The toothing is conspicuously fine and acute though rather deep, and remarkably directed forward. It is uniserrate, and though an occasional denticle is seen, the toothing could hardly be called irregular, certainly not biserrate. They are, for the most part, quite glabrous beneath, some of the leaflets having a little hair on the midrib only, and at the base of the petioles, some also with very short hairs in the furrow. The peduncles vary from solitary to a large cluster, some smooth, some with a very few glands. The fruit is quite globose, sepals with long points and pinnæ, styles in a long glabrous column, with a conical head of stigmas. Disc flattish.

Crépin, in Journ. Bot. 1896, p. 180, besides calling attention to the inaccuracy of Christ's description of this variety, of which he has seen specimens sent to Christ by Nicholson, expresses a doubt as to its being a *stylosa* form at all, but rather an *andegavensis*, but he wrote on a specimen of mine, "An extremely curious form of *stylosa*." Other specimens have been referred by M. Sudre at first to an unnamed variety of *R. andegavensis*, but on further study to a new *stylosa* form. He does not know var. *evanida*.

So far as I am aware, only two bushes of this very curious rose exist, close together on Ham Common, Surrey. They were burnt to the ground last year, but, I am glad to say, not killed. Nicholson said it was plentiful, but most certainly it is not so now. I have found one or two bushes of a *systyla* form there, but quite distinct from var. *evanida*. Before I knew *R. leucochroa* I have doubted var. *evanida* having been correctly referred to the *Stylosa* group at all. They are both certainly very aberrant members thereof, and I still think in most respects nearer the *Eu-caninæ*, but it may be that many varieties with long glabrous styles more or less combined into a column have been wrongly placed in the latter subsection. If so, the distinction becomes better marked than it appears to be at present.

Foreign Species of the Group of R. stylosa.

Though I have no special reason for supposing that any of the following species should be found in Britain, I mention them because of their similarity to British forms, and their liability to be mistaken for members of other groups. All appear to be rare on the Continent, possibly because some of their individuals may not always have been referred to the *Stylosæ*.

(*a*) Leaflets uniserrate:—

(i.) Peduncles smooth:—

R. chlorantha Sauz. et Maill. seems to be a form near *R. systyla*, but differing chiefly in its smooth peduncles. Its leaflets also are broader, and flowers white with a yellow claw. It agrees in most other respects.

(ii.) Peduncles slightly glandular:—

R. immitis Déségl. runs very near *R. virginea* Rip. Its prickles are quite *systyla*-like, its leaflets small but broad, and quite glabrous, peduncles sometimes quite smooth, and sometimes glandular on the same plant. Flowers white, with yellow claws. Fruit ovoid. Although apparently so near *R. virginea*, Déséglise does not discriminate it therefrom in his description, but separates it in his key by the peduncles being slightly glandular.

R. parvula Sauz. et Maill. is very like *R. immitis*, but its leaflets are hairy beneath. They may be either large or small. The fruit is small, ovoid, or pyriform. Flowers rose.

(*b*) Leaflets more or less biserrate:—

R. anceps Bout. A weak trailing plant with small prickles or none, small elliptical leaflets, often very little biserrate,

slightly hairy beneath. Peduncles glandular. Styles in a long glabrous column from a conical disc. Fruit globose and flowers white.

R. seposita Déségl. is more erect, with straight or slightly curved prickles. Its leaflets are seldom much, often scarcely at all biserrate, varying greatly in shape and size, normally glabrous beneath, but occasionally more or less hairy. Peduncles smooth. Flowers white. Fruit ovoid. Styles long but loose and hispid. Disc conical. The hispid styles are very unusual in the group, and this character combined with that of the very un-*systyla*-like prickles made the species a very doubtful member of the *Stylosæ*.

SECTION III. PIMPINELLIFOLIÆ.

This section as regards numbers of known species and varieties is a small one, about equalling the *Synstylæ*, but its British representatives are even fewer, and are contained in a single aggregate species, but it is convenient to deal with its hybrids as separate groups of the same section.

GROUP OF ROSA SPINOSISSIMA.

Although by no means the commonest species, *R. spinosissima* must be taken as the representative of this group, on account of its being an older name than *R. pimpinellifolia*. The use of the adjectival form of the latter permits it to be taken as the name of the section, in conformity with the usual Continental practice.

It is our best defined group, and always easily recognized, but being very prone to hybridity, runs by easy stages into the section *Caninæ*, especially the subsection *Villosæ*, and less frequently into the *Eu-caninæ*, as set forth in the following groups (pp. 26, *et seq.*). On the Continent hybridity with other non-British groups occurs.

The leading features of this group are those of the section, *viz.* small bushes with very numerous, very unequal, slender straightish prickles, leaflets 7 to 11, small, suborbicular, or oval, with rounded apex; stipules narrow, but with divaricate, broad, often dentate auricles; peduncles solitary, without bracts; fruit globose; sepals undivided, persistent; styles short, with a broad woolly head of stigmas.

Key to British Species.

1. Peduncles smooth 2
   Peduncles hispid-glandular 3
2. Leaflets uniserrate, small, suborbicular. Stem densely prickly and aciculate ..... *R. pimpinellifolia* Linn.
   Leaflets uniserrate, large, oblong. Stem unarmed, rarely with a few weak aciculi ..... *R. mitissima* Gmel.
   Leaflets biserrate. Petioles and midribs glandular ..... *R. Ripartii* Déségl.

3 { Large prickles mixed with aciculi on stem. Flowers white. Fruit black when ripe, subglobose ..... *R. spinosissima* Linn.
Stem only with small weak aciculi. Flowers rose. Fruit always red, urceolate ..... *R. rubella* Smith.

ROSA SPINOSISSIMA

Linnæus in Spec. Plant. i. p. 491 (1753).

"*R. caule petiolisque aculeatis, calycis foliolis indivisis.*"

As already mentioned, this species must stand at the head of the group, not only because it is the oldest Linnæan name, but also on account of the doubt as to what Linnæus really meant by *R. pimpinellifolia*, which will be referred to under that species.

R. spinosissima Linn. differs from *R. pimpinellifolia* Linn. only in having glandular hispid peduncles. Lindley, in Rose Monog. p. 52, subdivides it as follows:—

α Dwarf, prickles horizontal, fruit ovate.

* Peduncles glandular or setose (*R. spinosissima* Linn. Sp. Pl. p. 491).

** Peduncles naked (*R. pimpinellifolia* Linn. Syst. Nat. p. 1062).

β *reversa.* Dwarf. Prickles very slender, the lower deflexed. Fruit ovate.

γ *platycarpa.* Dwarf. Depressed fruit and peduncles setose.

δ *pilosa.* Dwarf. Leaflets acute, pilose beneath.

ε *turbinata.* Dwarf. Fruit turbinate.

β, γ, and ε were founded upon Irish forms which I have not seen. δ is the same as *R. involuta* var. *occidentalis*, one of the numerous hybrids.

Woods adopts the following arrangement, his type *R. spinosissima* Linn. having smooth peduncles:—

β Fruit-stalks rough with pedunculate glands. The flowers are sometimes very large.

γ *aculeatissima.* Fruit very large. Peduncles and fruit sometimes smooth, sometimes armed with aculei.

δ *pusilla.* Peduncles very short. Fruit large, depressed, almost buried amongst the leaves.

ε Peduncles setose. Fruit somewhat ampullæform, dark.

Woods adds that his var. ε was found near Newcastle by Mr. Robertson. He himself has never seen a specimen, but thinks it may be a dark-fruited form of *R. rubella.*

Excepting Lindley's var. *pilosa* (as a form of *R. involuta*), none of his nor of Woods's varieties appear to have been since recognized. Some of them may have been cultivated or abnormal forms, and in any case seem to be very rare.

R. spinosissima Linn., as above defined, is a much less common species in Britain than *R. pimpinellifolia.* I have seen specimens from several stations in Sussex, also from Kent, Surrey, and Roxburgh, but do not suppose that this at all adequately covers its distribution.

Rosa pimpinellifolia

Linnæus, Syst. Nat. ed. iv. p. 1062 (1759).

"*R. germinibus globosis pedunculisque glabris, caule aculeis sparsis rectis, petiolis scabris, foliolis obtusis.*"

He contrasts this with his modified description of *R. spinosissima* on the same page, "R. germinibus ovatis glabris, pedunculis, caule, petiolisque aculeatissimis." In the *Mantissa*, p. 399 (1771), Linnæus wrote opposite his *R. pimpinellifolia* (which he does not redescribe) that Haller makes it the same as *R. spinosissima*, describing the latter as having "pedunculi nunc inermes, nunc aculeati." In his herbarium there are two specimens both labelled *R. pimpinellifolia*, both being smooth-peduncled. One of these was collected by Jacquin, who labelled it *R. Austriaca* Crantz, which it does not in the least resemble. Jacquin added a note that it scarcely differed from *R. spinosissima*, except in its scented purple corolla, also in being a smaller and less spiny shrub; and from *R. Austriaca* in its undivided calyx and smooth fruit. Smith erased Linnæus's name *R. pimpinellifolia* and substituted *R. spinosissima*.

Déséglise, in Ess. Monog. pp. 43–46, goes deeply into the question of what *R. pimpinellifolia* Linn. really is, and in Cat. Rais. p. 83 arrives at the conclusion that there was considerable confusion with *R. cinnamomea* Linn., and that it should have rose flowers, while those of *R. spinosissima* should be white. Woods and Smith also admit the doubt surrounding the name of *R. pimpinellifolia*, though their views do not coincide with the later ones of Déséglise. This probably accounts for Smith's alteration of Linnæus's label on a smooth-peduncled specimen from *R. pimpinellifolia* to *R. spinosissima*.

All present-day authors, however, accept *R. pimpinellifolia* Linn. as the common typical form of the species, probably only varietally distinct from *R. spinosissima* by its smooth peduncles, and as such is mostly unlikely to be confounded with any other British species except *R. rubella*, under which its differences will be mentioned.

R. Ciphiana Sibbald is described in quaint diffuse language in Scot. Illust. pt. ii. p. 46 (1684). It is simply a rose-coloured form of *R. pimpinellifolia*, which grew in what Sibbald called his "Ciphian garden." There are specimens in the National Herbarium, also in those of Woods and Smith from Scotland without precise locality, and I have gathered it near Halling in W. Kent.

Rosa ripartii

Déséglise in Ess. Monog. p. 47 (1861).

"Shrub with reddish branches, charged with numerous unequal horizontal subulate and setaceous prickles, greyish on the stem, and reddish on young branches. Petioles more or less *charged with small fine stipitate glands and small setaceous prickles*. Leaflets 5–7, petioluled, *roundish oval*, the lateral subsessile, the terminal long-petioluled, glabrous, green above, pale beneath, midrib

with *small stipitate glands, doubly dentate with glandular denticles.* Stipules narrow, *glandular.* Auricles diverging. Peduncles solitary, axillary, glabrous or hispid. Calyx-tube globose, *glabrous* or *hispid, with rough and reversed glandular setæ at the base.* Sepals entire, lanceolate, acuminate, glandular. Styles short, villous. Flowers white, claws yellowish. Fruit roundish, coriaceous, red, becoming black when ripe, crowned by persistent sepals."

This differs from *R. spinosissima* in being more or less biserrate, the degree varying from very slight to quite strong. Its glandular development on petioles and midribs is very decided, and the glands often reach the secondary nerves, but its peduncles are usually, not always, smooth. The sepals in all I have seen are eglandular, though the description says they are glandular.

In Britain I have seen specimens from Barnes Common, Surrey, where *R. pimpinellifolia* exists in considerable quantity.

Rosa mitissima

Gmelin in Flor. Bad. Alsat. p. 358 (1826).

"*R. mitissima germinibus globosis pedunculisque glabris, petiolis mitissimis, subaculeolatis, caule ramisque inermibus.*—Quite like *spinosissima*, but differs in stem, branches, and peduncles unarmed, always smooth. Petioles thinly and minutely aculeolate. Leaflets 5 to 7, opposite, sessile, oval subobtuse, often oval lanceolate, acute, coarsely serrate, light green, glabrous, small. Flowers terminal on branches, peduncles solitary. Corolla small, white."

To judge from specimens placed to this species by Déséglise, not only are the stems quite or very nearly unarmed, but the whole habit is much laxer, and its leaflets are much longer and larger, $\frac{3}{4}$ in. long by $\frac{1}{2}$ in. broad, though still quite as rounded at the apex as in *R. pimpinellifolia.* Déséglise and Keller consider Gmelin's species to be synonymous with *R. pimpinellifolia* γ *inermis* DC. Fl. Fr. iv. p. 438 (1815), but no description is given by De Candolle, so I have not adopted his name. He remarks, however, in the text that it differs in its stems being entirely devoid of thorns, so it would appear that both he and Gmelin had a small-leaved plant like *R. pimpinellifolia* Linn. in their minds. They would hardly have failed to describe so noticeable a feature as the large oblong leaflets in Déséglise's specimens.

I have introduced this species into our list on the strength of a specimen collected by Mr. Ley at Llanthony, Brecon, and one by myself at 2500 ft. on Snowdon, Carnarvonshire. Both these have exactly the habit and foliage of Déséglise's specimens, and though both specimens have a very few fine acicles on the stems, I think they will best fit Gmelin's species. A specimen by Don from some unnamed station in Scotland is generally similar in foliage, but is much more closely covered with acicles, the leaflets also are somewhat biserrate, the petioles and midribs decidedly glandular, and peduncles long and hispid glandular, thus showing a close affinity with *R. Ripartii* Déségl. The lax habit may be the effect of altitude.

Rosa rubella
Smith, Eng. Bot. tab. 2521 (1810).

"Fruit globose, somewhat bristly. Flower-stalks bristly. Stems spreading, clothed with straight slender spines. Leaflets elliptical, smooth. Segments of calyx entire.—Sent from Newcastle by Mr. Winch. It differs from the common *R. spinosissima* in being a small spreading bush, whereas the flowering stems of that species are strong and erect, more in the manner of *canina*. The leaflets are more elliptical and rather acute; its stalks longer and densely covered with glandular bristles, some of which are also found on the lower part of the germen, which is rather less globular than in *spinosissima*. The perfectly ripe fruit is scarlet, not black. The flowers and leaves are elegantly tinged with red, which may be accidental."

Smith's figure shows no long stem-prickles, but only quite small and fairly numerous aciculi, which are very little stouter or longer than the glandular setæ on the peduncles. The leaflets are elliptical-oval, rounded at the apex. Petioles rather densely glandular. Peduncles hispid-glandular. Sepals glandular on back. Petals light rose. Fruit quite urceolate-ovoid.

Mr. Baker, in Review, p. 4, and Monog. p. 303, says that *R. rubella* has the general habit of *R. spinosissima*, but with fewer large prickles on the stem in proportion to the small aciculi. The leaflets are more oblong, simply or slightly doubly serrate, with glandular petioles and midribs. Peduncles always aciculate. Sepals simple though somewhat leaf-pointed, thinly glandular on the back. Flowers solitary or two together. Corolla cream-coloured, often reddish, 1 in. to 1½ in. in diameter. Styles densely villous. Fruit shortly ovoid-urceolate, slightly tapering to each end, often slightly setose at the base, and usually, but not always, drooping when ripe. He thinks that red-fruited forms of *R. spinosissima* have been confounded with it.

Many Continental botanists regard *R. rubella* Sm. as one of the forms of *R. pimpinellifolia* × *alpina* (or × *pendulina*, which is held to be a synonym). Crépin, however, regards it merely as an accidental variety of *R. pimpinellifolia*, and Keller only accepts the hybrid theory with doubt, since *R. alpina* does not grow in Britain. It is, however, both cultivated and naturalized, so that objection to hybridism may be set aside. The hybrid of course occurs in considerable quantity on the Continent, and in its typical form is very different from Smith's plant, but forms very near the latter do occur. Mr. Baker's statement that the fruit of *R. rubella* is usually drooping when ripe, which character cannot, I think, have been derived from any pure *pimpinellifolia* form, favours the hybrid theory, but no other British author mentions this feature, which is not indicated in Smith's figures. The only specimens I have seen, which may be British, showing drooping fruit are two of Lindley's from Hooker's herbarium at Kew, both of which apparently came from the same specimen, a cultivated one from the Horticultural Society's Gardens. Its origin is not stated, but

it is on the same sheet as a wild specimen from Winch, and may perhaps have been cultivated from it. Neither Winch's specimen nor another piece from Lindley on the same sheet shows drooping fruit. From Mr. Baker's mention of the fact that it is a plant well known in botanic gardens, he may have been describing from a garden form of the hybrid, since on the whole the evidence points to *R. rubella* Sm. being either a good species or a variety of *R. pimpinellifolia*.

There is a specimen at South Kensington from Winch, dated 1823, with no locality, but it agrees so exactly with No. 3 of Woods' herbarium by the same collector that I have little doubt that it is from the same plant "on the sands of the coast south of Shields, Durham." It has very small fine straight aciculi on some stems, none at all on others, and no larger prickles. The leaflets are quite elliptical-oval, obtuse, most of the teeth bearing a secondary denticle on the back, some petioles quite glandular, some almost or quite smooth, the auricles very large. Peduncles rather strongly hispid-glandular. Fruit large, subglobose or broadly ovoid. Sepals quite entire, very glandular on back. Styles in a large flat villous head. Various other specimens from the North of England and from Scotland have been referred to *R. rubella*, some no doubt correctly, but they are too imperfect to diagnose, and contain no notes as to the colours of the flowers or fruit, so they must remain doubtful. The most recent I have seen was collected by Mr. Pickard near the Forth Bridge in 1895. It resembles *R. rubella* in the uniformity of the acicles on the stem, but they are exceedingly numerous, much more so than in any other specimen, and though small are somewhat larger and stouter than usual. There is no admixture of larger prickles. The shape of the leaflets, their slight biserration, the hispid glandular petioles and peduncles, and its very dwarf stature, all favour *R. rubella*, but the specimen is only in flower, the colour not being stated.

Foreign Species of the Group R. spinosissima.

Though there is no special reason to suspect, from their distribution or frequency on the Continent, that any of the following species may occur in Britain, they deserve a brief mention, because although most of them have some striking feature to distinguish them, it may have been overlooked, and some rare form passed over as the type species. This is especially the case with the two first mentioned.

Midribs glabrous:—

Leaflets uniserrate:—

Styles glabrous or only thinly hispid:—

R. consimilis Déségl. This is very near *R. pimpinellifolia* but has glabrous styles. The midribs are said to be hairy on the very young leaflets.

R. spreta Déségl. This is generally similar but has thinly hispid styles, quite glabrous leaflets, and fruit contracted at the top.

Styles woolly :—

R. Mathonneti Crép. An alpine form, with the main prickles stout, and no acicles except on the branches. Leaflets rather large. Fruit large, pyriform, attenuated into a very short fleshy peduncle.

Leaflets biserrate. Styles woolly :—

R. myriacantha DC. (non M. Bieb.) is very near *R. Ripartii*, but is more prickly, with very small decidedly biserrate leaflets, which are decidedly glandular beneath. I have not seen a description, but, according to Mr. Baker, it has very strongly aciculate peduncles, and usually also calyx-tube, and deep red flowers.

Midribs hairy :—

R. Ozanonii Déségl. Very like *R. mitissima* in size and shape of leaflets, habit and absence of prickles, but the midribs are hairy. Keller believes it to be a *pimpinellifolia* × *alpina*, but Crépin doubts this.

R. reversa Waldst. & Kit. (non Lindl.) has biserrate leaflets, hairy midribs, and rose flowers. Keller considers it a variety of *R. alpina*.

GROUP OF PIMPINELLIFOLIÆ × VILLOSÆ.

This group of hybrids consists of *R. spinosissima* or *R. pimpinellifolia* (which are only varietally distinct) crossed with various members of the subsection *Villosæ*. It may safely be said that no two individuals in the group are alike, as might be expected from their hybrid origin. Collectively the group is called *R. involuta*, but there are quite a number of so-called species and varieties, which, however well-defined on paper, are inextricably mixed in the field. Their precise parentage is almost always obscure, not only as to whether they are drawn from the *pomifera*, *Sherardi*, or *tomentosa* groups, but still more which particular members of those groups are involved. I have therefore been compelled to retain all the old nomenclature, and until the forms are reproduced from their parents by some enterprising horticulturist, their origin must remain obscure. Fairly accurate guesses can be made between the groups by studying the habit of the growing hybrids, and the presence of some prevailing species in the neighbourhood may give a clue. For instance, in the South of England, neither *R. pomifera* nor *R. mollis* can be one of the parents, because they do not grow there. Beyond this it is impossible to go.

I do not hold with those who consider that *R. pimpinellifolia* × *tomentosa* (or as the case may be) is a sufficient name, even if "*forma*" be added. That type of designation must of course be adopted, but it must be followed by a varietal name. To refuse to accept varietal names for the different forms simply because their number is great or their segregation difficult seems to me as illogical and unscientific as to be content with "*R. canina* Linn. forma" for all the species and varieties of that aggregate. Some, at least, are well worthy of distinctive names.

As a group, these hybrids are usually easily recognizable. Their foliage almost always recalls *R. pimpinellifolia* in shape and colour, while the tomentum brings out the *Villosa* influence. There is always some, often much, admixture of acicles on the stems and branches, while the fruit and sepal characters are of an intermediate nature. The styles are densely villous.

Though the individuals are rather numerous, I cannot satisfactorily divide them into subgroups.

Key to British Species and Varieties.

1 { Leaflets simply serrate or only moderately biserrate 2
  { Leaflets fully compound-glandular-serrate 5

2 { Leaflets small, just like those of *spinosissima* var. *occidentalis* Baker.
  { Leaflets medium or large 3

3 { Leaflets quite uniserrate ..... *R. Wilsoni* Borr.
  { Leaflets more or less biserrate 4

4 { Sepals entire. Fruit aciculate ..... *R. involuta* Smith.
  { Sepals more or less pinnate. Fruit usually, not always, smooth var. *Robertsoni* Baker.

5 { Large prickles decidedly curved. Peduncles two, one slender often drooping. Stout bush ..... *R. gracilis* Woods.
  { All prickles straight or nearly so 6

6 { Peduncles and fruit smooth 7
  { Peduncles hispid-glandular 8

7 { Leaflets quite hairy. Sepals entire, eglandular var. *lævigata* Baker.
  { Leaflets quite glabrous above. Sepals pinnate, somewhat glandular var. *Webbii* Baker.

8 { Sepals more or less pinnate ..... *R. Sabini* Woods.
  { Sepals entire or very nearly so 9

9 { Leaflets very hairy. Flowers solitary, white. Fruit aciculate *R. Doniana* Woods.
  { Leaflets thinly hairy. Flowers 3 to 6. Fruit smooth (ellipsoid ?). A robust bush ..... var. *gracilescens* Baker.

Rosa involuta

Smith, Fl. Brit. p. 1398 (1804).

"*R. fructibus globosis, pedunculisque aculeatissimis. Aculeis caulinis numerosis, rectiusculis. Petalis involuto-clausis.*—Habit of *spinosissima*. Stem prickly all over, prickles of various sizes, sometimes rather hooked. Leaflets 7 or 9, elliptic-subrotund, obtuse, serrate, glabrous, midrib hairy beneath, petioles prickly. Peduncles terminal, solitary, straight, one-flowered, very prickly, Germen globose, very little depressed, armed all round with dense divaricate rigid prickles. Sepals acuminate, simple, muricate on back. Petals white, variegated with red, involute and closed, not expanded."

In Eng. Fl. ed. ii. p. 378 (1828), Smith says:—"Flower-stalks generally without bracteas, bristly like the globular fruit and simple calyx. Stem bristly and very prickly. Leaflets elliptical, doubly and sharply serrated, their veins hairy beneath. Petals

involute.—Akin to the last [*R. spinosissima*], as in that bearing innumerable crowded slender, very unequal, nearly straight prickles intermixed with glandular bristles, both of which are likewise observable on the downy footstalks. Leaflets 7, rarely 9, broadly elliptical, doubly and sharply serrate, the intermediate serratures numerous and glandular, green, smooth both sides except the ribs and veins, which are densely hairy beneath, sometimes above. Stipulas seldom changed to bracteas. Flower-stalks solitary, thickly covered with strong glandular acute bristles, as is almost universally the globular part of the calyx, whose segments are very bristly. Petals pale red, sometimes deep at the margins, all concave, and scarcely half expanded. Styles short. Ripe fruit not hitherto observed."

Mr. Baker, in Monog. p. 207, calls this *R. involuta* var. *Smithii*, and describes it thus:—"A stunted erect bush, with leaflets naked when mature on the upper surface, hairy principally on the midrib beneath, and scarcely at all glandular, the serrations closer and sharper than in all the preceding forms [*Sabini*, *Doniana*, *gracilescens*, and *Robertsoni*], and but slightly compound; the flowers solitary, the peduncle and calyx-tube densely aciculate, the sepals simple."

Smith has three specimens on one sheet in his herbarium. No. 1, from the Western Isles of Scotland, by Mackay, has almost the armature of *R. pimpinellifolia*. The leaflets are small, oval, rounded at apex, glabrous above, and slightly hairy all over beneath, not or scarcely glandular, and moderately to rather fully biserrate. The petioles are glabrous or slightly pubescent, and glandular but scarcely prickly. The stipules are narrow but with broadish dilated auricles. The peduncles and subglobose calyx-tube are very strongly setose, with mostly eglandular acicles. The sepals are undivided. The specimen is only just in flower, so the shape of the fruit and ultimate direction of sepals is indeterminable. There are two specimens labelled No. 2, both from gardens. One of these was grown at Cambridge from No. 1. It has its petioles pubescent and more densely glandular. Some of its sepals are somewhat pinnate, and all are spreading, not erect. The other specimen looks different, and has its leaflets much more hairy both sides. It would do very well, I think, for *R. Doniana* Woods.

Woods's No. 17 is from Sabine's garden at N. Mimms. It has very dense mixed prickles. The leaflets are glabrous above, and thinly hairy beneath, chiefly on the midrib, which is also glandular. Some are fully, others only slightly biserrate, the teeth often being eglandular. The petioles have many small prickles and are glandular, but glabrous or very nearly so. The peduncles and fruit are densely glandular-hispid, also the sepals which are quite entire.

R. involuta is almost certainly a *pimpinellifolia* × *tomentosa* hybrid, but the name has been used in such an aggregate sense that it is not easy to determine its limits from specimens, some of which may have had a *mollis* origin. Even those specimens

labelled var. *Smithii* do not seem at all well defined. I think in general that dwarf habit, subglabrous or thinly hairy leaflets, not very much biserrate, strong or at least dense armature, and sub-entire sepals are the leading features of the form. Its main prickles are straight and subulate, and are well marked off from the minor armature, which varies much in quantity, but in the best forms is plentiful. The leaflets are usually glabrous above and hairy on midrib or nerves only beneath, but in the forms which come nearest *Doniana* they may be hairy above, and more or less densely so all over beneath. The toothing varies from nearly simple to fully compound and glandular. There does not appear to be much in Mr. Baker's statement that it is closer, sharper, and less compound than in allied forms. The peduncles are always strongly glandular-hispid or setose, and the fruit may be densely covered with eglandular acicles, or with glandular setæ, or even smooth. The sepals, though normally entire, may occasionally have one or two pinnæ, indicating a passage to *Sabini*. The character mentioned twice by Smith and also by Woods, of half-closed flowers, seems a peculiar one for any rose. Robertson, on one of his sheets, suggests that this was the effect of dry weather. I have not seen the plant growing, so can give no notes from my own experience.

On account of the difficulty of satisfactorily segregating *R. involuta* from its allies I am unable to give its distribution, but believe it to be fairly general, and certainly rare in England, though more frequent in Scotland. It is doubtful whether it occurs at all on the Continent, though other forms of the hybrid are found, but only very rarely.

Rosa sabini

Woods in Trans. Linn. Soc. xii. p. 188 (1818).

"*R. ebracteata, caulibus setigeris, receptaculis globosis, calycibus compositis, foliolis duplicato-serratis.*—A shrub 4 to 6 ft. high. Branches straggling, fuscous, furnished with scattered unequal straight prickles, running into acicles. Petioles villous, glandular and prickly, with small straight prickles. Stipules linear, gland-ciliate, the floral ones somewhat broader and sometimes without leaves, becoming small ovate bracts. Leaflets 5 or 7, the upper pair and the odd one larger, all elliptical, biserrate, veined beneath, the veins hairy, somewhat glandular on the midrib and edges, the upper surface also hispid with scattered hairs. Peduncles 1 to 3, filiform, with unequal setæ. Receptacle globose, olive, furnished with setæ as on the peduncles. Sepals compound, with very narrow pinnæ, and not rarely setose with hairs and glands. Flowers red, large, expanded. Styles sub-included. Stigmas villous. Fruit globose; I do not know the colour when ripe.—From all other British setigerous roses *R. Sabini* is distinguished by the divided leafits of its calyx, but the segments are sometimes so strictly capillary as hardly to be distinguished from very large and long setæ."

Woods's No. 22, which is his earliest, though perhaps not his type-specimen in the same sense that "type" is understood now, is from Sabine's garden. It has its main prickles quite straight and moderately stout, as is usual in the group. Its leaflets are very nearly glabrous above; very little of their lower surface can be seen, but they appear to be thinly hairy and glandular on the secondary nerves. They are fully biserrate. The petioles are pubescent and glandular, but not much prickly. The stipules are more like those of *R. tomentosa* than is usual in the group. Its sepals bear several pinnæ. Its other characteristics are those of the group, and present no points of distinction from its allies. No. 23, from "near Dunkeld or Edinburgh," and No. 24, from near Dunkeld, both by Borrer, are very similar, and probably identical, but have their leaflets more hairy on both sides, and less glandular on midrib. They are very strongly biserrate. Otherwise they agree with No. 22.

Mr. Baker's No. 1, from Thirsk, has very slender quite straight prickles, only here and there densely mixed with short fine acicles. The stipules are short and broad, with widely diverging auricles, which are sometimes almost foliaceous, thus partaking of the character of *R. pimpinellifolia*. A difference such as this shows from Woods's No. 22 is to be expected in a hybrid. The leaflets are rather small, mostly obtuse or subobtuse, not quite fully glandular biserrate, with quite thin curly hair on the upper surface, which is somewhat thicker but not dense beneath, the midrib scabrous, but not glandular. Petioles with many small prickles, villous and glandular. Peduncles solitary, strongly setose, many of the setæ eglandular. Fruit globose, with very many stout eglandular acicles. Sepals erect and connivent, setose on back, mostly entire, but one or two bear small pinnæ. Styles in a broad flat head, less woolly than usual. The specimen bearing this number in Dr. Moore's herbarium has stouter main prickles and more numerous acicles. Its sepals are spreading or reflexed, and almost entire. The armature and subentire sepals bring this very close to *R. involuta* Sm. Mr. Baker's No. 2, from Cleveland, has some of its larger prickles somewhat curved, and fewer small acicles. The leaflets are rather large and more hairy, the midrib is not scabrous, but minutely glandular; they are very compoundly toothed, and might be described as triserrate, some of the denticles being deltoid and very spreading. The sepals are mostly quite entire, two out of nine bearing a single pinna each. They are quite spreading or even reflexed. In Déséglise's specimen bearing this number I can find no sepals showing pinnæ, but Dr. Moore's specimen shows several.

The chief feature relied upon by Woods and by later botanists by which to distinguish this variety from its allies is the pinnation of the sepals, but, as has just been shown, this is a weak and variable character, though, of course, by making a judicious selection, the two forms might be segregated in the herbarium, but I suspect they might be found upon the same bush. The generality of British specimens certainly show more pinnation

than in *R. involuta*, but I fail to find any other constant difference. The sepals are very often reflexed, but forms of *R. tomentosa* frequently have them so. The biserration of the leaflets is not always so compound as in Baker's and Woods's specimens, though perhaps usually more so than in *R. involuta*. They are occasionally glandular-scabrous on midribs, but very rarely so on secondary veins. Mr. Baker considers this much the most common representative of the group, reaching its maximum frequency in the North of England.

Rosa Doniana

Woods in Trans. Linn. Soc. xii. p. 185 (1818).

"*R. ebracteata caulibus setigeris, calycibus simplicibus, foliolis duplicato-serratis, utrinque hirsutis, aculeis strictis inæqualibus sparsis.*—Shrub, 2 ft. high, in hedges in Sussex sometimes even 5 ft. Branches subdiffuse, fuscous, furnished with straightish horizontally spreading unequal slender scattered prickles, ultimately running into setæ. Petioles glandular-villous, also sometimes furnished with very small acicles. Stipules linear-lanceolate, glandular serrate, tomentose, subequal, but sometimes the floral ones a little broader, and even becoming small bracts. Leaflets 7 or 9, elliptical, those belonging to the inflorescence rather fewer, the upper pair and the odd one larger than the rest, biserrate, villous both sides and eglandular. Peduncles solitary, cylindrical, furnished with unequal setæ. Receptacle globose, fuscous green, armed with stout setæ. Calyx leafits subulate, lanceolate, elongate, simple, or only here and there with a filiform lacinia, equalling the petals, villous-setose, greener than the receptacle. Flowers expanded. Petals white, obcordate. Styles included. Stigmas flattish. Fruit globose, setose; I have not seen it ripe.—From *R. gracilis* this is distinguished by its much smaller size, both in the whole plant and in each part, by its peduncles almost invariably solitary, and by the total want of the large curved aculei so characteristic of that plant. From *R. Sabini* by the leafits of the calyx, which in that species are uniformly divided." Woods adds that Don says it runs less at the roots than *R. involuta*.

Woods's No. 18, from Sabine's garden, looks very like *R. involuta* Sm., but the acicles on the stem are few. The leaflets are a good deal hairy on both sides, but not densely so. The petioles are hairy, rather thickly glandular, and aciculate. The leaf-toothing is not by any means very strongly double, and on some leaflets is comparatively slightly so; the midrib is quite eglandular. The fruit is densely setose or aciculate, the acicles being often eglandular. The sepals are entire. The other characteristics are those common to the group. No. 19, from Henfield, Sussex, and No. 20, from Water of Leith, are practically the same as No. 13, but a specimen at South Kensington from Sowerby's herbarium, gathered by Borrer at Henfield from the same bush as No. 19, consists of two branches, one of which has no main prickles, and those on the other are small and declining. The acicles on both

are few. The leaflets are broadly oval, subobtuse or rounded at apex, only moderately hairy both sides, rather more so beneath than above, fully biserrate, but teeth very often eglandular. A few small glands may be seen on some of the midribs, and many subsessile ones on the petioles, which are a good deal villous, some densely prickly, and others unarmed. Stipules broad, hairy, and often glandular on the back, with broad auricles. Peduncles rather densely glandular-aciculate, fruit and back of sepals moderately so. Some of the sepals have pinnæ. The flowers are only in bud.

There is another specimen from Woods at Kew, without locality. Its main prickles are stouter than usual and somewhat inclined or curved, thus approaching *R. gracilis* in the very character that Woods says is totally wanting in *R. Doniana*. The acicles are confined to two groups on the branches. Leaflets oval, rounded at apex, rather densely hairy above, more so beneath, the midrib neither glandular nor scabrous, fully but not very strongly, and often eglandularly biserrate. Petioles densely pubescent, somewhat glandular, unarmed, auricles widely diverging. Peduncles 1 or 2 together, glandular-hispid, but not densely so, the hispidity reaching the base of the fruit. Sepals entire, apparently eglandular on the back, but this cannot be easily seen.

This species runs very near both the last. In its dwarf size and entire sepals it resembles *R. involuta*, but in paucity of prickles and more compound biserration it is nearer *R. Sabini*. It is normally more densely hairy than either, but the less hairy examples overlap one or other of the two. It is said to have white flowers, which may form a good distinction in the field, though I doubt its constancy. If specimens named by Mr. Baker and Mr. Robertson are taken as a guide, quite considerably pinnate sepals are permissible, which breaks down the boundary between it and *Sabini*, to which, I think, such specimens should be referred. *R. Doniana* seems to be much more rarely glandular on the midribs than *R. involuta* and *R. Sabini*, but as a rule throughout the genus glands on the midribs have not much importance.

Its distribution is much the same as that of *R. Sabini*.

Rosa gracilis

Woods in Trans. Linn. Soc. xii. p. 186 (1818).

"*R. ebracteata caulibus setigeris, calycibus simplicibus, foliis duplicato-serratis, utrinque hirsutis, aculeis majoribus falcatis.*—Shrub 8 to 10 ft. high. Branches straggling, deep brown, prickly and setose, the larger prickles falcate, sub-binary, stipular, the smaller scattered, straight, having the form of setæ, and ultimately converted into them. Petioles villous and glandular, furnished with small falcate acicles. Stipules linear acuminate, glandular-serrate, subglabrous, the floral broader and at length by the absence of leaflets becoming small ovate acuminate bracts.

Leaflets 7 or 9, the upper pair and the odd one larger than the rest, all elliptical, biserrate, hairy both sides, glandular on the margins and also sometimes on the midrib, but never to my knowledge on the under surface. Peduncles 1 to 3, usually 2, with unequal setæ, the primordial erect, the secondary more slender, longer, and nodding. Receptacle globose, sometimes furnished with prickles at the base, sometimes glabrous. Calyx-leafits triangular lanceolate, equalling the petals, very rarely with a filiform pinnule. Flowers subcyathiform, petals obcordate, handsomely blush-coloured, base white. Styles included. Stigmas hemispherical. Fruit globose. I have not seen it ripe.—Besides the marks enumerated under *R. Doniana* by which this species may be distinguished, the peculiar length, slenderness, and apparent weakness of the second peduncle of *R. gracilis* may be mentioned. From *R. Sabini* it may be known by the simple leaves of the calyx."

Woods's No. 21 from between Keswick and Lorton has its main prickles only slightly curved, and though rather stout-based, they do not differ materially from those of other segregates. The leaflets are hairy both sides, fully glandular-biserrate, with glandular midrib. Petioles hairy, very glandular, but scarcely prickly. The character of the stout erect primordial peduncle and the slender curved secondary one can be seen, but it is hardly a striking one. It may of course be more evident on the growing plant, and have become straightened in drying, but at the best it is not a character which appeals to me. Differences in the length and direction of primordial and secondary peduncles are sometimes observable in any species, and differences in the shape of the fruit are frequent. In this specimen the primordial fruit is hispid, and the secondary one smooth. The sepals are quite entire and densely glandular on the back.

A specimen at Kew labelled by Woods as coming from his original bush has long stout main prickles, subulate rather than aciculate, and only very slightly declining, but those on the flowering branches are quite curved with more elevated bases than is usual in the group. The acicles are very small. Leaflets rather large, broadly oval, rounded or obtuse at apex, fully glandular-biserrate, quite hairy both sides, but not densely so beneath, slightly glandular on midrib. Petioles rather densely hairy and glandular, with few small straight not falcate prickles. Peduncles not densely glandular. They are broken, but still show their characteristic differences. Fruit globose, almost smooth. Sepals densely aciculate, three out of the seven visible bearing one pinna each.

Specimens in Déséglise's herbarium from Woods, gathered about Keswick and Lorton, have their main prickles curved, one or two almost hooked, but many of them are quite straight. They can hardly be called stout, though not so slender as in other varieties. The acicles are few and small. Leaflets large, variably hairy, compoundly serrate. Stipules narrower, and with longer more acute auricles than is usual in the group. Peduncles in

threes, the primordial of moderate length and rather stout, the secondary considerably longer, more slender, but quite straight, with a pair of bracts above the base, all densely glandular-aciculate, the fruit moderately so, the primordial more than the secondary. Sepals spreading, densely glandular hispid, slightly pinnate.

This species may be recognized by its size, the curvature of its prickles, and its peduncles. It is larger and stouter even than *R. Sabini*, with larger leaflets variably hairy, fully biserrate, and eglandular or almost so beneath. The prickle characters are not always very decided, and are best seen on the branches. The primordial peduncles are shorter and stouter than the lateral, which, besides being more slender, are usually longer and often somewhat curved. The sepals are as a rule entire.

It seems a more local plant than any of the preceding, but is said to be frequent about Keswick and in the Vale of Lorton, Cumberland. I have also seen specimens from the Clyde, from Ayton, N. Yorks, and what appears to be the same from Twickenham.

Rosa involuta var. Robertsoni

Baker, Monogr. Brit. Roses, p. 206 (1869).

"Intermediate between *Sabini* and the original *involuta*. Leaflets with the teeth sharper and less compound than in *Sabini*, glabrous when mature on the upper surface, hairy principally on the ribs and inconspicuously glandular beneath; calyx-tube sometimes but not always naked; sepals as compound as in *Sabini*."

This is not Mr. Baker's earliest name, but I select it as better fitting the modern arrangement of the group, and I do not want at present to make any new combinations. The earlier nomenclature in Review, p. 8 (1864), was *R. Sabini* var. *Robertsoni* Baker, with a very similar description, *viz.*: "Peduncles aciculate and setose. Calyx-tube nearly smooth, leaves with less compound teeth, nearly glabrous on upper surface, hairy principally on ribs beneath, and slightly glandular."

Specimens in herb. Borrer from Heaton Wood, near Newcastle, collected by Robertson, are probably from "the original station" mentioned in the Monograph (p. 206), but I cannot say whether they are from the original bush. They have their main prickles often quite as stout and as curved as in *R. gracilis*. The leaflets are sometimes fully glandular-biserrate, sometimes rather deeply and subsimply serrate, they are thinly hairy all over both sides or subglabrous above, and aciculate on midrib beneath. Petioles glabrous, glandular and almost unarmed. The peduncles, which are mostly solitary, and calyx-tube are strongly unequally glandular-aciculate, and the sepals often pinnate. The last-mentioned characteristic is the only important difference from *R. gracilis*, and even that is not a fundamental one. The glabrous

petioles and solitary peduncles are quite unimportant—in fact, *R. gracilis* sometimes has solitary peduncles.

Mr. Baker's No. 3, quoted by him as an *exsiccata*, is from Sowerby, Yorks. It bears the name of *R. involuta* Winch on the label. Winch, like many other botanists, used this name in a very aggregate sense. It has its main prickles few, aciculate, some straightish, others quite curved. Acicles almost absent. Leaflets rather small, regularly oval, somewhat narrowed or subtruncate at the base, rounded or subobtuse at the apex, very thinly hairy or subglabrous above, more hairy beneath with long strigose hairs, which are not principally on the ribs, as Mr. Baker says. The midribs only are slightly glandular, the serration usually slightly but sometimes considerably double, but the denticles are often quite small and even reduced to subsessile glands. Petioles subglabrous or thinly hairy, with many irregular glandular setæ and a few small acicles. Stipules thinly hairy on back with broad deltoid auricles. Peduncles 1 to 2, fruit densely glandular-hispid, hardly aciculate, also the sepals, some of which bear one or two pinnæ. Specimens of this number in herb. Moore have more aciculate fruit and quite strongly pinnate sepals with toothed foliaceous points. This plant, though making some approach to *R. gracilis*, differs but little from *R. Sabini*, unless perhaps in its less hairy leaflets and less compound though still quite biserrate teeth.

A plant which grows in some quantity near Ham Common, Surrey, has been accepted by Mr. Baker and others as var. *Robertsoni*. Being the only variety of the subgroup I have had any opportunity of studying when growing, I made the following description of it:—A dense bush 3 to 5 ft. high. Branches erectish, reddening in the sun. Prickles long, quite strongly declining, usually straightish but often curved, much stouter at the base than in most of the examples of *R. gracilis* I have seen, and on some shoots quite of an ordinary *canina* form. They are fairly numerous and mostly uniform, here and there unequal, but quite rarely running into small rather close-set acicles, so that some herbarium specimens might be quite without them. Leaflets 7 to 9, small, about $\frac{3}{4}$ in. long normally, but sometimes twice as long on the strong young barren shoots, broadly oval to suborbicular, never even subacute at apex, and often subcordate below, fully but not always very strongly glandular-biserrate, dark glaucous green, much paler when young, at first rather densely pubescent both sides, becoming thinly so but never subglabrous above when old, almost always rather strongly glandular on midrib, and very often decidedly so on lateral veins, and very finely obscurely so on lower surface. Petioles closely pubescent and densely glandular, with very small prickles. Stipules pubescent on back, strongly gland-ciliate, with lanceolate spreading auricles. Peduncles 1 to 3, usually 2, rather short, densely glandular hispid. Fruit very rarely maturing, small, globose, usually glandular hispid at base, occasionally thinly so all over. Sepals irregularly

spreading with long linear points, often with one or two long narrow-linear pinnæ, and usually, not always, very glandular on back and edges. Styles in a dense woolly head. Flowers pale rose, petals usually all fallen before the end of June.

A specimen in herb. Moore, collected in Derry and named by Mr. Baker, is probably the one referred to in the Monograph, p. 206. It has no large prickles, but a considerable number of inconspicuous acicles. Leaflets large, very broadly oval, very much rounded at both ends, almost subcordate at base, the lateral ones oblique-based, coarsely toothed, the teeth with rather numerous small secondary denticles, more hairy above than usual, and densely so beneath, not glandular. Peduncles solitary, long, with mostly eglandular acicles. Fruit small, globose, aciculate at base only. Sepals spreading, broader than usual, decidedly leaf-pointed and pinnate, some glandular, some not. This is the nearest to *R. Sabini* that I have seen.

The above four examples really differ from one another more than their descriptions show, but at the same time they bear some superficial mutual resemblance. The chief point of resemblance lies, I think, in the dark green suborbicular leaflets, with coarse primary toothing, the secondary denticles, though always present in more or less quantity, being small and inconspicuous. They vary much in hairiness, but as a rule are thinly hairy to subglabrous above and seldom densely so beneath; the only specimens I have seen which are glandular other than on the midribs are my own from Ham Common. The prickles seem to bring this variety much nearer to *R. gracilis* than to either *R. involuta* or *R. Sabini*, especially the Ham Common plant, which I think ought really to be placed to that species, and it may be the same as the Twickenham *R. gracilis*, of which I have not seen good enough specimens to judge. The divided sepals of var. *Robertsoni* are perhaps the strongest objection to this suggestion, but the curved stout prickles seem quite as strongly in favour of it. It is certainly better placed between *R. gracilis* and *R. Sabini* than between the latter and *R. involuta*, as Mr. Baker places it.

Rosa involuta var. gracilescens

Baker, Monogr. Brit. Roses, p. 206 (1869).

"A robust Irish form gathered in Co. Antrim by Dr. Moore, with leaves 3-3½ in. long, ovate leaflets, thinly hairy on both sides, not at all glandular beneath, with copiously compound toothing, the terminal one 15–16 lines long by nearly an inch broad; petioles with few or no aciculi and glandular setæ; flowers 3–6 in a cluster, aciculate peduncles, and naked elliptical calyx-tube."

I have seen no other description than the above, nor any specimens, so can say little of it. It appears to be as robust a form as *R. gracilis*, but no mention is made of the prickles nor the sepals. The elliptical calyx-tubes, 3 to 6 in a cluster, should be a conspicuous feature.

Rosa involuta var. lævigata

Baker, Monogr. Brit. Roses, p. 207 (1869).

"Peduncles and calyx-tube quite naked, the latter depresso-globose; the leaves like those of *Sabini* in toothing and clothing, the petioles villose and glanduloso-setose, but scarcely at all aciculate; the sepals are quite simple and not glandular on the back."

Through the great kindness of Mr. F. W. Moore, A.L.S., I have been able to see the specimens in Dr. Moore's herbarium from Umbra Rocks, Derry, which Mr. Baker tells me constitute his type, though his description of the fruit and sepals is rather that of Hailstone's Broughton Spa plant. Moore's specimens have their main prickles much stouter and more triangular in form than those of most of the group, and are often somewhat curved, like those of *R. gracilis*; the small acicles very few. Leaflets normally small, but quite large on a luxuriant shoot; they are broadly oval or suborbicular, quite rounded at apex, fully but not very compoundly biserrate, rather thickly hairy both sides, eglandular beneath except sometimes on midribs. Petioles more or less pubescent and glandular, with few prickles, though those of the strongest leaves have stouter prickles than is usual in the group. Stipules somewhat enlarged upwards, with speading auricles. Peduncles rather short, 1–4. Fruit of medium size, subglobose, inclining to urceolate, smooth. Sepals spreading erect, entire or one or two with short setaceous pinnæ, mostly somewhat glandular on the back, but not densely so.

Hailstone's Broughton Spa, W. Yorks, specimen, No. 45 of herb. Baker, is very similar in armature and leaflets, but the latter are slightly glandular beneath, and not always fully biserrate. The sepals are quite entire, smooth on back, scarcely at all glandular ciliate. The fruit is small, smooth, and globose.

R. involuta var. *lævigata* can be distinguished in the group from all other varieties except var. *Webbii* by its quite smooth peduncles and fruit, and from var. *Webbii*, which it approaches perhaps too closely, by its decidedly more hairy leaflets, and entire or subentire sepals, which are smooth on back or nearly so.

I have seen it from no other station except those quoted above. An example by Sadler from Edinburgh, placed here by Mr. Baker, is referred to under var. *Webbii*, which is very near var. *lævigata*.

Rosa involuta var. Webbii

Baker in Journ. Bot. 1874, p. 338.

"It has the copious unequal straight prickles of the type; leaves like those of *Doniana* in size, shape, and serration, but quite naked on both sides, except that the midrib is clothed with a few obscure adpressed hairs. Common petioles furnished with copious acicles and gland-tipped bristles, but scarcely at all pilose. Peduncles and ovary entirely naked, sepals for the species unusually large and compound (on one of the specimens now before

me all over an inch long, with a dilated leafy point, the largest with three pairs of erect patent pinnæ), copiously glandular ciliated, but nearly naked on both sides, and oblong-urceolate fruit entirely destitute of bristles and acicles. It comes nearest the Belgian [*R. coronata*] var. *subnuda* Crép., but that has leaves almost as densely glandular beneath as in the *Rubiginosæ*."

Webb's specimen from Hoylake, which is Baker's type, has its main prickles short, declining, and subulate rather than aciculate, with very few small scattered acicles. Leaflets of moderate size, oval, subobtuse, glabrous above or very nearly so, thinly scattered hairy beneath, and scabrous or somewhat glandular on midrib, fully but not very strongly biserrate, the teeth quite eglandular. Petioles almost glabrous, but a good deal glandular and prickly. Peduncles solitary, long, smooth. Sepals long, those on one fruit only with strongly developed incised pinnæ, but this seems abnormal: the others are scarcely pinnate, glandular ciliate, and with thinly scattered but quite conspicuous glandular acicles on the back. Fruit urceolate-subglobose. A specimen in Déséglise's herbarium from the same station differs in the sepals, only some of which have an occasional very short pinna, which makes me think that the occasional strong pinnation noticed by Mr. Baker is abnormal.

This variety is very near var. *lævigata*, and if it be allowed that the sepals on the type specimen are abnormally developed, the difference resolves itself into the more glabrous leaflets of the present variety. I think both seem better placed under the *R. eu-caninæ* × *pimpinellifoliæ* than in the present group, but do not feel sure enough to displace them. The biserrate hairy leaflets could of course come from some species allied to *R. canescens* Baker or *R. hemitricha* Rip.

An example from Edinburgh by Sadler is perhaps even nearer to a *dumetorum* hybrid, though it is placed under var. *lævigata* by Mr. Baker. It is only the end of a flowering branch, and therefore not a good specimen for diagnosis. It has a few small prickles, and two small clusters of acicles. Its leaflets are broadly oval or suborbicular, uniserrate or very nearly so, only a very few leaflets having two or three teeth with denticles. They are quite glabrous above, hairy on midrib, and very slightly so on nerves beneath; petioles very thinly hairy, slightly glandular and with one or two small prickles. Peduncles short, smooth. Fruit globose, smooth. Sepals eglandular, entire or nearly so.

Rosa Wilsoni

Borrer in Hooker, British Flora, ed. 3, p. 231 (1835).

"Prickles crowded, unequal, straight, intermixed with setæ, leaflets simply serrated, having their disc eglandular, calyx simple, fruit ovate-urceolate.—About 3 ft. high, of slender habit, well furnished with very unequal straight prickles and glandular setæ. Leaflets 7–9, or 5 towards the flowers, oval, sometimes cordate, blunt, not acuminate, simply serrated, hairy on both sides, the

ribs beneath rather more so, and the midrib beset with glands like the petiole, which bears also a few small prickles, which are falcate or almost uncinate. Stipules copiously fringed with glands, widened upwards, pointed and somewhat divaricate. Flowers usually three together, bracteate, the primordial bracteæ a pair of enlarged stipules with a terminal leaflet, the others simple, oval, or lanceolate, acute. Peduncle setose. Calyx-tube broadly ovate, almost globular, with a short neck, sparingly setose, sometimes naked, segments persistent, copiously setose and glandulose, shorter than the petals, with a slightly dilated point, and occasionally a capillary pinna. Petals rather large, pink. Styles included, hairy. Stigmas forming a round protuberant mass. Fruit scarlet."

This species seems to be distinct from the others of the group and shows much affinity with the next, but I keep it in the present one, since the strength of the glandular setæ on the peduncle, combined with the considerable hairiness of leaflets, the deep pink flowers, and the very glandular keeled sepals, make the diagnosis of a *dumetorum* parent difficult. It is said to bear a close resemblance to var. *occidentalis* Baker and *R. rubella* Sm. I have not seen any of the three growing, but to judge from herbarium specimens, the two last-mentioned bear an obvious and close resemblance, in foliage at any rate, to *spinosissima*, while *R. Wilsoni* hardly has even a superficial resemblance to that group. Borrer (*l. c.*) says: "Whatever might be supposed from the specific characters, this plant has no resemblance in its appearance to *R. spinosissima*."

Specimens from the Menai Straits, its original station, in which only a small bush now exists, have their main prickles mostly rather small, straight, horizontal or slightly declining, rarely a little curved, the small aciculi not numerous, though generally distributed all over the stem and branches. Leaflets decidedly large for the group, turning purplish in late summer, oblong, or elongate-ovate, *i.e.* broadest rather below the middle, varying from acute to rounded at the apex, all frequently subcordate or cordate at base, the lateral also often oblique, quite uniserrate, though the teeth are not quite uniform in size, thinly hairy above, and scattered hairy all over the lower surface, midrib often somewhat glandular. Petioles rather densely hairy and glandular, with many small prickles. Stipules rather narrow, auricles spreading but not dilated. Peduncles solitary, rarely two, with unequal but not very numerous acicles and glandular setæ. Fruit large, often much more urceolate than is usual in the group, but also often subglobose, generally smooth, but sometimes with a few glandular setæ. Sepals densely glandular-setose on the back, quite entire, erect though not connivent, and less persistent than usual.

There is a note from Wilson on his specimen in Smith's herbarium as follows:—"Fruit urn-shaped, not globose. Prickles very numerous, straight. Calyx-limb persistent, nearly erect, segments keeled. Flower-stalks mostly with bracts. It is a slender shrub about 3 ft. high, remarkable for the purple tinge of the

whole plant; the edges of the leaflets are very observable for having this property. The fruit is scarlet, occasionally with a few scattered bristles, often smooth. The limb of the calyx is truly permanent and copiously glandular, the segments quite simple and keeled very strongly. Petals of a deep pink colour. Scarcely less prickly than *R. spinosissima* which grows along with it. The seeds are very large and rounded." This specimen has more numerous fine acicles on the stem than any other I have seen. The leaflets also are smaller and rounder, though still quite oval and decidedly cordate at base.

This species may be recognized in its group by its quite uniserrate leaflets, the only others having them sometimes nearly uniserrate being *R. involuta* Sm., also var. *Robertsoni* and var. *occidentalis*, from which its urceolate, not globose, fruit, and usually more oblong leaflets will distinguish it. I have, however, seen specimens in herb. Moore from Umbra Rocks, Co. Derry, apparently correctly placed to *R. Wilsoni*, which have quite globose rather small fruit; also spreading reflexed sepals. Sadler's Edinburgh plant, mentioned under var. *lævigata*, also has uniserrate leaflets, as have most of the forms of the next group.

Rosa involuta var. occidentalis

Baker, Monogr. Brit. Roses, p. 207 (1869).

"Very near *Wilsoni*, but the leaves smaller, slightly hairy beneath, and the petioles glanduloso-setose and aciculate, the serrations nearly but not quite simple; the peduncle densely aciculate and glanduloso-setose, the calyx-tube globose, naked, the main sepals not more than half an inch long, with one or two setaceous pinnæ each side.

This variety was originally described by Lindley as *R. spinosissima* var. *pilosa* (see p. 21), but Mr. Baker thought it better placed in the present group, to which Crépin says it undoubtedly belongs. It bears a very close resemblance to *R. spinosissima*, so close that it might readily be passed over, in the herbarium at least, for that species, except for its hairy midribs.

There is a specimen at Kew from herb. Hooker, from some unknown Irish station. It is small and dense, with the close-set suborbicular leaflets of *R. spinosissima*, coarsely and almost simply serrate, glabrous above, and glabrous or subglabrous beneath except for the hairy rather densely glandular midribs. Petioles subglabrous, densely clothed with acicles and glandular setæ. Stipules broad. Peduncles solitary, very densely aciculate and glandular. Calyx-tube smooth, subglobose. Sepals somewhat aciculate and glandular, quite pinnate. None of the buds are open.

Foreign Species of Pimpinellifoliæ × villosæ.

Forms of this group of hybrids are found under some twenty different names, including several of our British ones, very thinly scattered over North-Western Europe, *viz.*, Scandinavia, Belgium,

France, and Germany. Like our own, they are not very clearly defined, and cannot be satisfactorily dealt with in a short note. I propose therefore to specify one only.

R. coronata Crépin. By its description this would appear to come nearest to *R. Sabini*, with which Mr. Baker considers it synonymous. It differs mainly in its leaflets being very much more glandular beneath, so much so that it might be thought to be a hybrid with one of the *Rubiginosæ*, but its leaflets are more tomentose than any species of that group, and the subfoliar glands, though often very numerous, are smaller than is usual therein. Crépin's own specimens also differ from most of the present group in having almost uniform slender aciculate prickles with no minor armature or very little, though Crépin credits its prickles with being "very unequal . . . some small." This character throws some doubt on their hybrid origin. The leaflets are 7 in specimens, though Crépin says they are 9 to 11. They are elliptical oval, obtuse, or more or less attenuate at each end, which, again, is unusual in the group. Crépin did not at first suspect its hybrid origin till he had seen *R. Sabini* and *R. involuta*, when he saw the similarity. He says it is a shorter, more slender plant than either.

His variety *submuda* seems even more remote from this group, and it is difficult to see why he places it as a variety of *R. coronata* at all. It has elliptical, slightly hairy, very glandular leaflets, remarkably shallowly biserrate, and quite smooth peduncles and fruit. Its prickles and sepals are like those of the type, but the appearance of the plant is totally different.

GROUP OF EU-CANINÆ × PIMPINELLIFOLIÆ.

This group is a small one, the British forms numbering four, under the collective name of *R. hibernica*, which is derived from one of the hairy-leaved *Eu-caninæ*, as is also var. *cordifolia*, though its other two varieties are derived from species with glabrous leaves.

These hybrids differ from those of the last group in the armature being much more scattered; the large prickles are stouter, and usually quite curved or hooked, often quite like those of average *canina* forms, while the acicles are almost always few and segregated into a few clusters. The leaflets, though usually of a dark glaucous green and recalling those of *spinosissima*, are as a rule less suborbicular and decidedly more acute or acuminate than those of the last group. They are simply serrate or almost so, and never densely hairy, more often glabrous or subglabrous. The peduncles are almost always smooth, the sepals naked on the back and considerably pinnate, and the styles densely villous. The fruit, usually abortive, shows no constant difference.

Key to British Species and Varieties.

1 { Leaflets hairy beneath 2
  { Leaflets glabrous both sides. Peduncles smooth 6

2 { Peduncles hispid 3
  { Peduncles smooth 4

3 { Leaflets glabrous above, thinly hairy veins beneath. Sepals spreading, pinnate ..... var. *cordifolia* Baker.
  { Leaflets hairy above and all over beneath. Sepals erect-connivent, entire ..... *R. Wilsoni* Borrer.

4 { Leaflets uniserrate ..... *R. hibernica* Temp.
  { Leaflets biserrate 5

5 { Leaflets quite hairy. Sepals entire, eglandular *R. involuta* v. *lævigata* Baker.
  { Leaflets quite glabrous above. Sepals pinnate, somewhat glandular *R. involuta* v. *Webbii* Baker.

6 { Sepals pinnate. Fruit scarcely urceolate ..... var. *glabra* Baker.
  { Sepals entire or nearly so. Fruit quite urceolate-globose var. *Grovesii* Baker.

I have included *R. involuta* vars. *lævigata* and *Webbii*, also *R. Wilsoni*, as they are liable to be mistaken for members of the present group, if indeed the first two do not actually belong to it.

Rosa hibernica

Templeton in Trans. Dublin Soc. ser. 2, vol. iii. 1802, pp. 162–4 (1803).

"It grows to five or six feet high; the stems reddish, and a very dark red in winter; armed with crooked aculei; branches less thorny than the stems; leaves nearly round (or round oval), dark pleasant green above, lighter and somewhat glaucous beneath, very sharply serrate, petioles unarmed; peduncles unarmed, sometimes two together, at other times single; two or three of the calyx-leaves simple, the others pectinated; petals entire, slightly tinged with red; flowers weak-scented, germs inverse pear-shaped. It begins to flower in July with *spinosissima*, and continues until November. From the above description the specific characters will be: rose with inverse pear-shaped fruit, smooth peduncles and petioles, and round oval leaves sharply serrate."

Templeton's figure shows scattered not very numerous very irregular prickles, the largest rather small, moderately stout, very slightly curved, the smallest aciculate, but there is no segregation of acicles as often occurs in the group. The leaflets are mostly 9, ovate subacute with broad subtruncate bases, and simple rather coarse teeth. The peduncles are 1 to 3, long, smooth, fruit almost truncately conical, very broad and emarginate at base, about 7 by 6 lines, with short erect entire sepals shorter than itself, but there are two separate drawings of the sepals, one showing all five long narrow and pectinate, as described, rather than pinnate; the other shows what I believe to be the commoner form, namely, broader, two entire, and three decidedly pinnate.

The above, as has been pointed out in Journ. Bot. 1907, p. 305, is undoubtedly the earliest description, and the name having been proposed by Templeton, he must of course stand as the author of it.

Smith's description in E. B. tab. 2196 (1810), hitherto accepted as the earliest, runs :—"Fruit nearly globose, smooth, as well as the flower-stalks. Prickles of the stem slightly hooked. Leaflets elliptic, smooth, with hairy ribs. The fruit is slightly elongate upwards, so as to approach an ovate figure, but it is always round and broad at the base. The stem is 6 ft. high, upright, much branched, and very prickly. Prickles scattered, slightly hooked, deflexed. Leaflets broad-ovate or roundish, smooth, their ribs and veins hairy at the back. Flower-stalks often solitary, often 2–3 together, smooth. Petals pale blush-coloured."

Smith's fuller description in Eng. Fl. ii. p. 393, is as follows :—"A compact bush from 3 to 6 ft. high, copiously branched and very prickly. It has much the habit and character of the first section of the genus [*spinosissima* and *involuta*], and some of its smaller prickles look very like bristles, but they are not glandular, nor quite straight. The curvature of all the prickles, indeed, is but slight, though the larger ones are sufficiently hooked, as well as compressed, to entitle the plant to a place in our third section [*tomentosa* and *canina*], being, moreover, allied to several neighbouring species. Leaflets 5 or 7, smaller than most of this section, elliptical or roundish, acute, strongly, sharply and rather unequally but by no means doubly serrated, and quite destitute of glands, the upper surface a little glaucous, rarely besprinkled with fine longish hairs, under side smooth except the ribs, which bear plenty of white hairs, unequal in length and direction. Footstalks hairy and in some instances prickly, not glandular. Stipules smooth, dilated upwards, minutely serrated, with spreading points, the uppermost often changed for smooth ovate pointed slightly serrated bracteas. Tube of the calyx globular, very smooth, segments of the limb pinnate, with a few linear lanceolate entire leafits, neither cut nor glandular. Flowers rather small, of a light blush colour. Floral receptacle very flat. Styles distinct. Fruit orange-coloured, roundish ovate, sometimes almost exactly globose, crowned with the upright persistent segments of the calyx about its own length."

Though the above descriptions should amply suffice to diagnose *R. hibernica*, if its group is identified, there may be some difficulty in the latter, so the following notes may be of use. Templeton's specimen at South Kensington is too scrappy to be of service, but those in Smith's herbarium are of the former's collecting. Their prickles are short and straight, stouter-based than in most *involuta* forms, and practically uniform, though there is only a short piece of stem. Those on the branches are smaller, but there are no acicles. The leaflets are small and close set, and recall those of *R. spinosissima*. They are deeply acutely uniserrate, thinly hairy on midrib, and subglabrous on secondary nerves. Peduncles short. Calyx-tube globose, fruit not formed. Sepals smooth and eglandular, fully pinnate. A separate fruit on the sheet is small and globose, not ovoid nor urceolate. An author's specimen at Kew differs materially in its small stout hooked prickles from long bases, and its large elliptical acuminate leaflets

more or less narrowed below, deeply acutely and irregularly serrate. Flowers in a cluster of four. Sepals reflexed.

Déséglise in Cat. Raisonné makes this one of the *glauca* group, with which it has some affinity, but Christ's opinion, expressed in Journ. Bot. 1875, p. 100, that it is a *canina* × *spinosissima* hybrid, is probably the correct one, and is accepted by all modern botanists. The *Eu-caninæ* parent must, of course, come from the *dumetorum* or *coriifolia* group, to account for the hairy leaves.

Its leading features are more or less *canina*-like prickles, but this is often not very pronounced: they are irregular, but much less so than in the *involuta* group, with some acicles here and there, but often not in all parts. In Mr. Barclay's Scotch specimen the mixture of armature is decidedly more marked. The leaflets are small, and somewhat *spinosissima*-like, quite simply, usually coarsely, but rarely at all irregularly serrate, rather thinly hairy and quite eglandular beneath. Peduncles and subglobose or broadly urceolate fruit smooth. Sepals quite pinnate, eglandular, usually spreading or reflexed. Styles villous.

Besides its Irish stations in Derry and Down, this occurs near West Kirby in Cheshire and in Cumberland, and I possess a specimen from Mr. Barclay, from between Mid and East Lothian. It, therefore, is probably quite a rare plant in Britain, and has not been satisfactorily identified on the Continent.

Rosa hibernica var. glabra

Baker, Review of Brit. Roses, p. 21 (1864).

In the notes following his description of *R. hibernica* Mr. Baker classifies its forms as follows:—

"1. *eu-hibernica.* Peduncles naked, petioles hairy. Leaves hairy beneath.

"2. *glabra.* Peduncles naked. Petioles and leaves hairless.

"3. *cordifolia.* Peduncles aciculate and setose. Leaves broader and more bluntly toothed, almost hairless."

I have seen no other description, but in Monog., p. 209, Mr. Baker mentions this as "a form with sharper teeth and leaves quite naked."

There is certainly more in this variety than the above brief diagnosis expresses. It is no doubt a *eu-canina* × *spinosissima* hybrid, like *hibernica* itself, but with one of the glabrous varieties of the *eu-caninæ*. In addition to the fact that its leaflets are glabrous, all the specimens I have seen have them considerably narrower, quite elliptical (*i. e.*, longish as compared with their width) and more acute or even acuminate, which gives the plant quite a different aspect to that of *R. hibernica*.

I have seen it growing near Meols, in Cheshire, where it is locally most abundant, in some places filling whole hedges, and growing to a height of 10 or 12 ft. It at once attracts attention by the peculiar dark bluish-green glaucous colour of its leaflets. They are somewhat irregularly serrate, as they are also on Mr.

Marshall's Sutherland specimens, and the petioles have a few very long hairs upon them such as I have not seen in any other rose. The main prickles are stout, long and curved, and there is an abundant admixture of minor armature. The other characters are those of *R. hibernica*, but the sepal pinnæ are few, small, and very narrow.

Mr. Baker reports it from Sutherlandshire, Durham, Cumberland, N. Yorks, Cheshire and Surrey. I have collected specimens in Cheshire and have one by Mr. Marshall from E. Sutherland.

Rosa hibernica var. Grovesii

Baker in Report of Bot. Exch. Club for 1876, p. 15 (1878).

"An erect compact bush from 3 to 5 ft. in height. Prickles of the barren stem more slender and less hooked than in *canina*, $\frac{3}{8}$ in. long, with a scar $\frac{3}{8}$ in. long, passing down by gradual transitions into a few subulate straight slightly declining aciculi, some of which are gland-tipped. Leaves of the barren shoots 3 to 4 in. long, glaucous, glabrous; stipules glabrous, with a few glands on the edge; common petiole with 4–6 minute aciculi, some of which are gland-tipped. Leaflets oblong, $\frac{3}{4}$ to $1\frac{1}{4}$ in. long, sharply irregularly but not distinctly doubly dentate; teeth rarely gland-tipped, end leaflets 1 to $1\frac{1}{4}$ in. long, $\frac{3}{4}$ to $\frac{7}{8}$ in. broad, broadly rounded at base. Flowers 1–3, usually solitary; peduncles naked, $\frac{3}{8}$–$\frac{1}{2}$ in. long. Calyx-tube broadly oblong, naked, segments $\frac{1}{2}$–$\frac{5}{8}$ in. long, naked on the back, with a distinct leafy point, some simple, some sparingly pinnate. Corolla milk-white, 18–21 lines across when expanded, petals an inch long. Styles densely pilose. Fruit broad, ovoid, $\frac{5}{8}$–$\frac{3}{4}$ in. long, turning colour at the end of August, deep crimson-red, the spreading sepals fully persistent, still remaining attached in October."

Although the two varieties do not appear to be identical, var. *Grovesii* seems to come too near to var. *glabra*. Messrs. Groves, its discoverers, say of the former in Bab. Man. ix. p. 134: "robust, very glaucous, sepals almost always simple, fruit ovate urceolate," and of var. *glabra*, "quite glabrous, peduncles naked." There is certainly little, if anything, to choose between the two in robustness of growth, nor in glaucous colouring. The sepal pinnation in var. *glabra* is often very slight, while a certain amount may always be seen in var. *Grovesii*. Somewhat more important differences, though still not great ones, may be seen in the smaller less acute leaflets, white flowers, and larger more decidedly urceolate fruit of var. *Grovesii*. I think it would be wiser to combine the two under the older name of *R. hibernica* var. *glabra* Baker.

I have seen the two bushes on Barnes Common, Surrey, from which the type was derived, and made the following notes from them on the spot. They are 8 to 9 ft. high and very dense and broad. Stems reddish, prickles often quite stout and hooked, seldom running into acicles, though they can be found here and there, sometimes singly, sometimes in clusters. The leaflets are dark green and very glaucous, quite glabrous and eglandular

except a rare gland or two on a few midribs. They are rather small, oval or broadly so, subobtuse or acute, seldom rounded at the apex as in *involuta*, nor as acuminate as in many *canina* forms, rather coarsely irregularly serrate, sometimes with a large secondary tooth between each primary one, but the primary teeth themselves seldom again toothed. Petioles glabrous, or a little hairy on the upper surface, especially at the nodes. Stipules glabrous, gland-ciliate, narrow, with lanceolate auricles. Peduncles mostly solitary, with short bracts or none. Petals very pale rose, becoming almost white. Sepals long, narrow, entire or with one or two very slender short pinnæ, reflexed at first after flowering, then spreading or sometimes erect, eglandular and glabrous or thinly pubescent on back and edges. Styles in a short broad woolly head. Fruit decidedly urceolate-globose.

I know of no other station for this variety, but a specimen from Wimbledon Common labelled "*R. canina*, towards *hibernica*" I think belongs here. It has most of the characters of var. *Grovesii*, but there are only one or two pricklets mixed with the main prickles, which are stout and hooked. This may be the Surrey station referred to by Mr. Baker under var. *glabra*.

Rosa hibernica var. cordifolia

Baker, Review of Brit. Roses, p. 21 (1864).

For description, see under *R. hibernica* var. *glabra*, p. 44.

In his Monogr. p. 210, Mr. Baker says:—"Prickles more slender and denser than in the type, the large ones scarcely curved. Terminal leaflets 15–18 lines long by one inch broad, the base cordate. Leaves nearly naked below, the teeth more open and blunter than in the type, the peduncle aciculate and glanduloso-setose up to the base of the calyx-tube."

There are two of Prof. Oliver's specimens at Kew, from Hooker's herbarium. They were collected between Flotterton and Rothbury in Coquetdale, the only station quoted by Mr. Baker, and though not so labelled, are doubtless his types, or at least from the same bush. They have much mixed armature, the main prickles being straightish and slender. The leaflets are mostly 7, widely spaced on the petioles, rather large, especially on the barren stem, broadly oval and subacute, or suborbicular and rounded at apex, broadly rounded or emarginate, hardly subcordate, at base, broadly and shallowly simply serrate, midribs hairy and often glandular or finely aciculate, the secondary nerves hairy or glabrous. Petioles glabrous or nearly so, with fine scattered glands and several small acicles. Stipules narrow, auricles very variable, often foliaceous. Peduncles solitary, long, about one inch, shortly but rather densely hispid and glandular. Fruit subglobose, smooth. Sepals mostly reflexed or spreading, pinnate. Styles woolly.

Whether this variety be derived from restricted *R. spinosissima* crossed with a simple *R. dumetorum* or *tomentosa* form, or from *R. pimpinellifolia* and one of the *Deseglisei* subgroup, it is not

easy to say, but it bears all the leading characteristics of an *involuta* form, i. e., *pimpinellifoliæ* × *villosæ*, and there is no doubt in my mind that *R. hibernica* var. *cordifolia* is simply *R. Wilsoni*. The differences from that hybrid are less than the differences between specimens of it gathered at different times on the Menai Straits, and presumably from the same bush. Var. *cordifolia* is a little less hairy; I can see no other difference.

Unnamed Varieties.

There are two plants worthy of mention here, which, if they really belong to this group, can hardly belong to any of the above varieties.

The first is mentioned by Mr. Baker in Monogr. p. 209, as gathered by Dr. Moore in Derry. It is a glabrous form, but has larger nearly round leaflets and blunter teeth than in var. *glabra*. It seems to be near *R. Schultzii* Rip., mentioned below.

The other specimen is one at Kew, from Alnwick, and certainly belongs to this group. Its barren stem has densely mixed armature, the large prickles straight or nearly so, but deflexed, not particularly stout. Some of those on the old stem, however, where the mixture is less, are stout and hooked. The leaflets are elliptical-oval, acute or even acuminate, which is quite unusual in this group; they are quite glabrous and glandular-biserrate. The petioles are glabrous, glandular, and with hooked prickles, auricles rather broad. The fruit cannot be easily seen, but appears globose on short smooth peduncles. The sepals are long, narrow, spreading, and pinnate, styles in a dense woolly head. Its fully biserrate leaflets remove it from all named forms of the hybrid, and point to a *dumalis* parentage.

Foreign Species of R. eu-caninæ × pimpinellifoliæ.

Examples of this group are of very great rarity on the Continent. The provinces of Savoy and Cher, also Bavaria and Lorraine, produce one or other of the following, but none of our British forms have been identified elsewhere.

R. sabauda Rap. has quite straight rather long and stout prickles, which are unequal but do not run into acicles. Leaflets elliptical, acute, rarely obtuse, usually quite glabrous, rarely slightly hairy beneath, almost uniserrate. Peduncles solitary, aciculate. Fruit smooth, large, globose or suburceolate. Sepals erect connivent, entire or pinnate. This has usually been regarded as a form of *R. pimpinellifolia* × *tomentosa*, but if a *pimpinellifolia* hybrid at all, which the shape of its leaflets and the absence of acicles make doubtful, it fits better into the present group. The shape of its leaflets removes it from typical *hibernica*, and they are even more *canina*-like than those of var. *glabra*, from which its somewhat pubescent leaflets and hispid peduncles remove it. The *canina* parent may be some *Deseglisei* form, but the strength of the glandular setæ on the peduncles is not easy to account for.

R. Schultzii Rip. has its prickles rather few, but mixed, curved,

and rather stout. Its leaflets are very orbicular, like those of *spinosissima*, but much larger, glabrous and somewhat irregularly serrate. Peduncles solitary, smooth. Calyx-tube quite globose. Sepals pinnate; developed fruit not seen, but said to be always abortive. Ripart thought this just between *canina* and *pimpinellifolia*, but did not suggest hybridity. Schultz, however, thought it was a hybrid, as it doubtless is.

R. armatissima Déség. & Rip. has stout straight very unequal prickles running into acicles, oval acute slightly biserrate leaflets, short smooth peduncles, long narrow somewhat pinnate spreading sepals, large ovoid or ellipsoid fruit, and hispid not villous styles. It comes near var. *glabra*, but has somewhat biserrate leaflets, and seems altogether a stouter more strongly armed plant, looking more like a true *canina* but for its very mixed armature. The large well-formed fruit and the hispid not villous styles are unlike the other members of this group.

GROUP OF PIMPINELLIFOLIÆ × RUBIGINOSÆ.

The existence of members of this group of hybrids in Britain has been scarcely more than hinted at, though specimens under some such aggregate name have been distributed through the Botanical Exchange Club. They may always be distinguished from both the last groups by their comparatively abundant and conspicuous subfoliar glands.

At least three forms of the hybrid have been gathered in Britain.

Key to British Species and Varieties.

1 { Leaflets small, roundish, obtuse. Prickles very unequal, densely mixed ..... *R. biturigensis* Bor.
  { Leaflets large, elliptical, acute. Prickles subequal, mostly large ... 2

2 { Leaflets glabrous above, hairy midribs only beneath ..... var. *Nicholsonii* Crép.
  { Leaflets hairy both sides ..... var. *Moorei* Baker.

Rosa biturigensis

Boreau, Flore du Centre de la France, ed. 3, ii. p. 220 (1857).

"A straight elevated shrub, forming a rounded bush, with spreading branches, reddish, as also are the leaves, in autumn; prickles very numerous, slender, unequal, the smallest straight, the others hardly curved, very dilated, compressed; petioles glandular, bearing 7 small elliptical or roundish, obtuse leaflets, doubly glandular-dentate, with open teeth, a little villous and covered with glands beneath; stipules glandular with diverging auricles; peduncles very short, solitary or geminate, smooth; calyx-tube globular, smooth; sepals tomentose within, a little pinnatifid, longly appendiculate; styles very hispid; petals white; fruit ovoid-globular, red, pulpy in autumn, with persistent, erect, not connivent sepals. Root creeping.—Aspect of *R. pimpinellifolia*, but

near *rubiginosa* in its characters, from which it differs by its prickles, its much earlier white flowers, its smooth peduncles, &c. This species occupies a very extended space, and if it were a hybrid, as Mr. Schultz considers, one would be surprised to find it more abundant than its parents."

Déséglise has five sheets in his herbarium, of which four come from the same station near Bourges, in Central France. Two of these have been marked "*vidit* Boreau." The main prickles in some are hooked and stout, but less so and only curved or declining in others. The minor armature is very abundant, and in those specimens with large hooked prickles, well marked off therefrom, but in others the prickles are mixed and of all sizes, while one has all its armature weak and slender. Leaflets 7, small and broadly oval, very rounded at apex, rather deeply and fully biserrate, glabrous above, slightly hairy beneath chiefly on midrib, and densely glandular. Petioles glabrous or nearly so, densely glandular, with many very small prickles or acicles. Stipules usually broad, always glandular on back, auricles very variable in form, usually acuminate or lanceolate, but sometimes quite broad and deltoid. Peduncles solitary, rarely two, short, quite smooth. Fruit smooth, rather large, broadly ovoid, tending to urceolate, but in one specimen quite obovoid; it is always quite globose when young. Sepals spreading or reflexed at first, ultimately erect and somewhat connivent, a good deal pinnate, not glandular on back, though gland-ciliate, persisting till at least September. Styles cannot be seen.

There is no doubt about this being a *pimpinellifolia* × *rubiginosa* hybrid, the typical form of which has not been found in Britain, but forms very near it have been gathered at Boxley Warren, E. Kent, and by Mr. Barclay at Caputh, E. Perth. These differ primarily in their glandular aciculate peduncles, fruit, and sepals, which latter also are more entire, and the armature is more completely mixed, like that of *R. pimpinellifolia*. The flowers of the Boxley plant are rose, not white as in the type. I do not know the colour of the Caputh specimens.

Though these may be sufficient grounds for giving a varietal name to our British form, I hesitate to do so. Great variation must be expected in hybrids, and the naming of several different forms has already given rise to great confusion in the *pimpinellifolia* × *tomentosa* group.

Rosa involuta var. Nicholsonii

Crépin in Bull. de la Soc. Roy. de Bot. de Belg. xxi. p. 119 (1882).

"Leaflets of medium or rather large size, broadly oval or suborbicular, perfectly glabrous above, midribs a little pubescent, and secondary nerves a little pubescent, or glabrous, with numerous glands spread over the whole lower surface; teeth very glandular-compound. Outer sepals with 1 to 4 appendages. Flowers two. Branches and branchlets densely setigerous."

I have seen no specimen of this, so can only supplement

Crépin's description by quoting Mr. N. E. Brown's note on Nicholson's type from Suppl. to Eng. Bot. p. 133:—"Branches rather densely covered with straight aciculi and setæ. Leaves with glandular petioles and 5 to 7 elliptic or suborbicular obtuse leaflets, $\frac{5}{8}$–$1\frac{1}{8}$ in. long, $\frac{1}{2}$–1 in. broad, glabrous above, glandular all over beneath, and pubescent on the midrib, the teeth gland-ciliate. Flowers 1–3 together. Peduncles $\frac{1}{2}$–$\frac{3}{4}$ in. long, densely covered with rather long glandular setæ; calyx-tube subglobose or ellipsoidal, more or less gland-setose. Outer sepals sparingly pinnatifid, glandular on the back. Gathered at St. Cyrus, Kincardineshire."

So far as the above descriptions are concerned, I cannot see how this variety differs from var. *Moorei*, except in being much more densely armed, and perhaps its more fully biserrate leaflets. I think both are *pimpinellifolia* × *rubiginosa* forms.

Rosa involuta var. Moorei

Baker, Monogr. Brit. Roses, p. 207 (1869).

"Prickles stouter than in any of the other forms, the largest 5 to 6 lines long, slightly curved, the scar $\frac{3}{8}$ in. deep. Leaflets nearly naked above, thinly hairy and densely glandular beneath, the serration like that of *Smithii*, the petiole scarcely at all hairy, but densely glanduloso-setose and furnished with numerous unequal aciculi, the larger ones decidedly falcate. Flowers one or more, both peduncles and tube densely aciculate and glanduloso-setose. Largest sepals 8–9 lines long, slightly pinnate.—Recedes from the type (by its prickles and leaves glandular beneath) towards some of the *Rubiginosæ*, but yet evidently belongs here."

Had it not been for the great kindness of Mr. F. W. Moore, who lent me Dr. Moore's type-specimen from the Glasnevin Herbarium, I could have given no notes on this interesting hybrid. Mr. Baker has written a full description on the sheet containing the specimen, which was gathered in the parish of Tamlaghbard, on the shores of Lough Foyle, Derry. It runs as follows:—"Bush two to three feet high. Prickles unequal, the largest about $\frac{3}{8}$ in. long, moderately robust below, slightly curved. Leaves 2–3 in. from base to apex of terminal leaflet, which is elliptical or typically ovate, and measures about $\frac{3}{4}$ in. long by $\frac{1}{2}$ in. broad. Leaves dull brownish green, and very nearly naked above, paler and thinly hairy all over beneath, and rather thickly sprinkled with viscous glands, the serration sharp and moderately connivent, the main serrations furnished each with two or three sharp gland-tipped teeth, the petiole scarcely hairy but densely setose, and furnished with numerous very unequal aciculi, the largest of which are falcate. Stipules very slightly glandular and not hairy on the back, closely setoso-ciliated. Flowers single or more than one, the peduncles densely aciculate and setose, the calyx-tube subglobose and more or less prickly, the sepals $\frac{3}{4}$ in. long, leaf-pointed, densely glandular on the back, truly persistent, mostly simple, but

the more luxuriant ones with a pinna on each side.—I cannot tell whether this is more like *Sabini* or *rubiginosa*. The prickles and leaves look very like those of the latter, the calyx is rather that of the former. It comes very near in some respects the French *R. biturigensis* Bor., but this has naked peduncles, fruit, and sepals."

I can add but little to the above. The prickles are sometimes quite straight, sometimes decidedly curved. They are stout, but not abnormally so, much like those of *R. gracilis*, and the specimen shows no acicles, but an example on another sheet, with no locality mentioned, has decidedly stouter prickles with a few acicles. The leaflets are elliptical rather than ovate, and more acute than is usual in *pimpinellifolia* hybrids. Mr. Baker's "rather thickly sprinkled with viscous glands" is a better description than his "densely glandular" of the Monograph. I can see very little resemblance to *R. biturigensis*.

Mr. Marshall's No. 813, from between Beauly and Lentram, E. Inverness, labelled var. *Nicholsonii* Crép. by him, belongs here from its very stout curved prickles, large elliptical very acute leaflets, quite hairy both sides, more or less sprinkled all over beneath with fine glands. Its peduncles are 2–3 together, just like those of *R. gracilis*, viz. one short and stout, and two long and slender but straight, glandular hispid; fruit nearly smooth. Sepals spreading, rather fully pinnate.

It is of course possible that both var. *Moorei* and var. *Nicholsonii* have been derived from some very glandular form of *tomentosa*, though few of them are, as a rule, sufficiently glandular; moreover the other characters tend to show a *rubiginosa* parentage, though with which species of the subsection it is difficult to say.

SECTION IV. CANINÆ.

This section of British Roses is by far the largest of the four in which they are comprised. Crépin, Rouy, and Keller all treat it on much the same lines, giving it a broader significance than Déséglise did, who regarded it as equivalent only to the *Eu-caninæ* subsection of the other three authors. The subdivisions followed by these four authors are set forth in my paper on the subsection *Eu-caninæ* in Journ. Bot. 1908, Suppl.

I propose to subdivide the section into three subsections, *viz.* *Villosæ*, *Rubiginosæ*, and *Eu-caninæ*, the last-mentioned having been dealt with in this Journal as above quoted. The leading characteristics of the three are as follows, and though exceptions will be found to all the characters mentioned, there should seldom be any difficulty in referring any example to its proper subsection.

Villosæ.—In their typical form these have straightish, slender prickles, with small bases, very tomentose leaflets, which are often glandular on the lower surface, and almost always very strongly biserrate, peduncles almost always and fruit generally glandular-

hispid or aciculate, sepals erect and more or less persistent, and woolly styles. Some forms make a near approach to the *corii-folia* group of *Eu-caninæ*, and some rarely simulate forms of the *Rubiginosæ*, but, regarding the characters as a whole, the sub-section is a well-defined one.

Rubiginosæ.—These have prickles usually stout and hooked, though sometimes straightish and slender. Their leaflets are biserrate, often hairy, but never densely tomentose as in the last section, and they are covered all over the lower surface with sticky scented glands. The peduncles are almost always and the fruit often glandular-hispid. Sepals much as in the last sub-section. Styles various.

Eu-caninæ.—Prickles for the most part uniform and hooked, leaflets uniserrate or biserrate, glabrous or moderately pubescent, eglandular beneath, or rarely glandular on secondary nerves, never on whole under surface. Peduncles, sepals, and styles various.

SUBSECTION VILLOSÆ.

This subsection is undoubtedly our most complicated and difficult one, and I should have had great difficulty in understanding it at all, but for the most kind assistance of the Rev. A. Ley and Mr. Barclay; the former especially has supplied me with large numbers of specimens of forms I should otherwise have known little about, while Mr. Barclay has most patiently supplied me with many notes and specimens of living plants. Many of the specimens from Mr. Ley have been lent by Mr. Bailey from his own herbarium, to whom my thanks must also be extended. Without these specimens I might have gone astray completely on *R. suberecta* Ley and *R. tomentosa* var. *uncinata* Lees.

Our list at present comprises just two-fifths of the numbers contained in the *Eu-caninæ*, but this relatively small number to my mind does not simplify matters, and I think it should be considerably increased. At present several of the species have to be regarded in an aggregate sense, as they each really cover a considerable range of individuals. This is, I think, especially true of *R. mollis* Sm., *R. omissa* Déségl., *R. suberecta* Ley, and *R. tomentosa* Sm., and, to a less degree, of several other species. Moreover, it is quite possible to arrange a given collection in various ways, though using the same specific and varietal names, according to individual opinion as to whether greater importance should be given to this or that technical feature, since the characteristics assigned to the various species and varieties by their authors do not vary conjointly. I have, for example, seen specimens which can hardly possibly be assigned to anything but *R. pomifera* Herrm., having quite hooked prickles, and a considerable series might be made of examples which have all the leading features of the *tomentosa* group, but with the subpersistent sepals of that of *Sherardi*. Similarly incongruous combinations are met with in all species, so that the choice lies between the aggre-

gation of very heterogeneous material under one name, or the creation of new species or varieties, or at least the adoption of Continental names, hitherto unknown, or little known, to British botanists.

Following my plan adopted for the rest of these papers, I have, almost without exception, only dealt with names already in use in this country, and have not suggested any new combinations. It is more than likely that several of our forms, named or unnamed, are covered by Continental names, which would sooner or later be found to be preferable, and would displace any hastily given. Also any new combination would, in all probability, have to be changed again when the subsection is thoroughly revised, as it must be, with the whole genus, in the near future. I even prefer for the present not to publish foreign names given by M. Sudre and Prof. Dingler to specimens which Mr. Ley or I have sent them, till further study proves them to be identical with or sufficiently near the typical forms to warrant their adoption in our list. Most of the species and varieties will therefore be named as their authors named them, but I have ranged them under the groups to which they must, in my opinion, eventually be referred.

I propose, for the purposes of this paper and not as a final arrangement, to subdivide the subsection into three groups, *viz.* *R. pomifera* (including *R. mollis*), *R. Sherardi* and *R. tomentosa*. Most authors make two subsections, one containing *R. pomifera* and *R. mollis*, the other *R. omissa* (which includes *R. Sherardi*) and *R. tomentosa*. The main subsectional difference relied upon by such authors is the relative persistence of the sepals, combined with other and less stable features, which on the whole appear to be of less importance than the differences between two such groups as *R. canina* and *R. coriifolia*. It seems hardly consistent, therefore, to subdivide the *Villosæ* into higher grades than groups, especially as that of *Sherardi* is exactly intermediate between the other two, and all shade off imperceptibly into one another.

Briefly the groups may be defined as follows :—

Group of *R. pomifera*. Of low growth. Stems rigid, with straight internodes. Prickles* slender, straight. Leaflets usually densely pubescent, fully biserrate. Upper stipules with falcately incurved auricles (according to Continental authors). Peduncles usually short. Flowers deep rose. Fruit becoming soft and pulpy early, crowned by the subentire persistent sepals, which adhere till the fruit itself decays or falls off. Styles villous.

Group of *R. Sherardi*. Usually low dense bushes, with a habit intermediate between that of the *pomifera* and *tomentosa* groups. Prickles straight or somewhat falcate, rarely uncinate, slender, seldom stout. Leaves, as a rule, densely pubescent, but

---

* The prickles on the middle part of the old stems (which produce the flowering-branches) should be examined. Those on the flowering-shoots themselves, or on the barren shoots, are deceptive and usually uncharacteristic.

occasionally thinly so or even glabrous, biserrate, rarely uniserrate. Upper stipules with porrect or spreading auricles. Peduncles short or long. Flowers usually deep rose, rarely pale or white. Fruit ripening later than in the *pomifera* group, and less pulpy, always retaining its sepals, which are somewhat pinnate, spreading or erect until long after it changes colour, and usually till its complete maturity, but not till its decay. Styles villous, rarely only hispid.

Group of *R. tomentosa*. Usually tall bushes. Habit lax and arching, as in most *canina* forms. Prickles often stout and falcate, sometimes straight, seldom quite hooked. Leaflets more or less pubescent both sides, sometimes quite densely so, sometimes thinly or subglabrous, biserrate, rarely uniserrate. Upper stipules as in last. Peduncles long, sometimes very long (up to four times as long as the fruit). Flowers usually pale or bright, rarely deep rose. Fruit soft when ripe, but hardly pulpy. Sepals, which are often quite pinnate, and flatter on the back than in the last two groups, reflexed or spreading and deciduous before the fruit turns colour, or at the latest, always before it ripens. Styles hispid or glabrous, rarely woolly.

GROUP OF ROSA POMIFERA.

As already stated, I make this include both *R. pomifera* Herrm. and *R. mollis* Sm. They appear to be so intimately connected by intermediates that the differences are only specific, or, as some may think, only of a varietal nature. The leading features of the group may be recapitulated as follows. The bushes are rather short and erect, not arching as in most of the *Eu-caninæ*; their prickles are slender and straight or very nearly so, from small bases; leaflets always densely softly tomentose on both sides, usually rounded at apex, sometimes acute but very rarely acuminate, and the stipules broad with deltoid auricles. Most authors make a feature of the auricles of the upper stipules of the flowering-branches being falcately incurved, instead of porrect or diverging. This is certainly not observable in dried specimens, nor have I been able to discover what is meant from the few living specimens I have had an opportunity of examining. The sepals are entire or very slightly pinnate, and are narrow and very rounded in transverse section. The most important feature is the complete erection and connivence of the sepals as the fruit ripens, and their persistence until its decay. There is no disarticulation at their base, as is usual in the next group, but the bases become incrassated, and often redden with the fruit. The stigmas are always in a dense villous head, so broad as to cover the whole disc, which is, however, not absent, as some authors state, but narrow.

Key to British Species.

1 { Leaflets large, oblong, rather thin. Prickles rather few 2
{ Leaflets smaller, oval or elliptical, thick. Prickles more numerous 3

2 { Leaflets more or less parallel-sided, glandular beneath or not. Prickles very straight. Armature of peduncles and fruit stout *R. pomifera* Herrm.
Leaflets parallel-sided or elliptical-oblong, very glandular beneath. Prickles often slightly curved. Armature of peduncles and fruit weak ..... *R. recondita* Pug.

3 { Fruit small, smooth. Peduncles often smooth or nearly so *R. villosa* var. *cærulea* Woods.
Fruit larger, hispid-glandular. Peduncles always hispid-glandular 4

4 { Leaflets thinly hairy or subglabrous, densely glandular beneath, and often so above. Prickles very straight *R. pseudo-rubiginosa* Lej.
Leaflets densely hairy, almost or quite eglandular beneath 5

5 { Prickles unequal. Leaflets often rather small, pubescence shining. Stipules broad, with deltoid auricles. Sepals subentire. Flowers rose ..... *R. Grenierii* Déségl.
Prickles subequal. Leaflets larger, pubescence dull. Stipules narrow, auricles acuminate. Sepals pinnate. Flowers deep rose *R. mollis* Sm.

Rosa pomifera

Herrmann, Dissertatio de Rosa, p. 16 (1762).

"Calyx-leaves semipinnate, germen globose, aculeate, leaves tomentose both sides.—Stem of the shrub stiff, often reproducing the bush by the extension of the root. Flowers small, purple in the cultivated plant, at least two, more often three on each lateral branch, on short peduncles, the middle flower almost sessile, in the wild plant more often solitary. Peduncles hispid, furnished with lanceolate bracts. Pome globose, rather large, bristly with flexible spines, red throughout maturity, in the wild plant certainly black, as Haller also observed. Calyx-segments patent, doubly appendaged, elongate. Leaflets of the wild plant five, of the garden one seven, the former smaller, the latter larger, decreasing, tomentose on both sides, here and there even hispid, glutinous, soft, greener on the upper surface, toothed, the teeth again denticulate, odoriferous. Petioles terete, villous, armed with straight spinules. Stipules sagittate, broad, hispid on edges, cusps erect. Spines of the stem glabrous, strong, at the nodes and internodes, incurved, green, fuscous in summer. Flowers at the beginning of summer."

The above description, considering the period at which it was written, is fairly clear, yet while it goes into some detail on unimportant points, fails to give prominence to those by which it may be distinguished from *R. mollis* Sm., for the simple reason that neither that nor any other segregate of the group had then been described. The following notes, drawn up from an examination of Déséglise's specimens and description, as well as that of Keller, will, I think, make this species unmistakable.

It forms a strong bush, 2–3½ feet high, rarely reaching 5 feet, sometimes with a short trunk as thick as a man's arm. Bark of branches dark shining brown. Prickles usually few, never numerous, rather small, sometimes rather unequal, straight,

slender, subulate or almost aciculate, from flattish bases. Leaflets thin in texture, large, elongate, usually oblong with parallel sides, 2 in. by 1 in., but forms occur with more oval leaflets usually rounded at both ends, or subacute at apex, subcordate at base, rarely appreciably narrowed, very finely, but rather densely, softly tomentose above, somewhat more coarsely, but still finely, tomentose beneath, and almost always somewhat, though usually very finely, glandular all over the lower surface. The toothing is compound-serrate. The primary teeth are broader than deep, rather coarse, each with 5–10 denticles on back, and 2–5 on front edge, two or three of the former being much deeper than the rest, so that the leaflets become triserrate. All the denticles are glandular. The petioles are shortly but densely pubescent, almost felted, with a good many subsessile or shortly, rarely longly, stalked glands, and some very small pricklets or none. Stipules broad, especially the upper, broadly rounded or almost amplexicaul at the base, usually glabrous within, and densely glandular-pubescent, or tomentose with stipitate glands on back, very densely and shortly gland-ciliate on edge, and often quite strongly inciso-dentate. Auricles broadly deltoid, sometimes quite rounded, with an apiculus on the inner side of the median line, which is the nearest approach I have seen to the falcately-incurved form attributed to them. They are very rarely acuminate. Peduncles 2–3, equalling or shorter than the fruit, rarely longer, strongly glandular-hispid, often glandular-aciculate. The true leaves reach the base of the peduncles, so that they are usually ebracteate; the bracts, when present, are small. The fruit is described as being larger than that of *R. mollis*; but comparing the bulk of the specimens of the two species as represented in Déséglise's herbarium, this feature is not apparent. It is usually globose, about $\frac{1}{2}$ in. each way, often less, rarely as much as $\frac{3}{4}$ in. Occasionally it is quite ovoid, with the central one of a cluster somewhat obovoid, glandular-aciculate to a variable degree, but the acicles always stout, the largest often eglandular, rarely almost unarmed. The fruit is violet when ripe. Sepals long and narrow, keeled, or sharply rounded on back, with a subfoliaceous apex, and more or less, occasionally considerably, pinnate, very densely glandular-hispid or glandular-aciculate on back, spreading after the fall of the petals, but soon becoming erect and connivent, incrassate and often coloured at the base, which does not become disarticulated from the fruit, but the sepals persist till its decay. Styles in a broad, densely villous head, usually covering the whole disc, but the latter may often be seen. Petals bright rose-red, or purplish, very often gland-ciliated both at the apex and the base.

Déséglise made the mistake of supposing *R. pomifera* to have its leaflets eglandular beneath, but glands are almost always present, often in considerable quantities; moreover, Herrmann described them as "glutinous." Crépin points out this error (Bull. Soc. Roy. Bot. Belg. xxi. p. 100), and also remarks that the petals, though gland-ciliate on the lobes, are never so, in his experience, at the base. As regards the falcate auricles, which

neither Mr. Ley nor I have been able to discover, Crépin (*op. cit.* xxiv. pt. 2, p. 54) remarks that their importance is considerable. He says that all species and varieties of the *R. pomifera-mollis* group may be distinguished from all the *Tomentosæ* by the stipules of the former being more or less dilated. The auricles of the middle and upper stipules of the flowering-branches are more deeply cleft, the outer edge usually bent round towards the petiole so as to bring their points inwards, thus making them more or less falciform. In *R. tomentosa* the auricles are usually short, triangular, with diverging points, the outer edge not bent round in the direction of the petiole. He adds the significant remark that these characters are not as a rule visible in herbarium specimens. If this test be as infallible as Crépin states, which I take the liberty of doubting, there should be no difficulty in separating this group from the two which follow.

The above notes may appear long for a species which is doubtfully British, but Mr. Ley considers it native in Breconshire, and in two or three Scottish and North English stations. It is also certainly quite naturalized in other counties. Another reason for giving considerable detail is the fact that its characters and points of distinction from its allies do not seem to me to have been well brought out by authors.

I have seen specimens from near Deal, by Mr. Druce, and above Sweethope, Roxburgh, by Brotherston, "far from houses, and not seen in any garden in the district"; also from Cromarty Firth, both in Roxburgh and Ross, by Mr. Bailey. The Gloucestershire specimens are *R. recondita* Pug., if that species can stand at all.

The name of *R. villosa* Linn. is too indefinite to retain. It doubtless covered both *R. pomifera* and *R. mollis*.

Rosa recondita

Puget in Déséglise, Revue de la Sect. Toment. p. 46 (1866).

"*Low shrub, 46 cm. to 1 m. 50 cm. high*, with violaceous or purple branches. Prickles of the stem scattered, little abundant, dilated at the base in the form of a disc, whitish, little robust, long, straight, horizontal, those of the young branches of a fulvous colour, some very dilated at the base, often geminate. Petioles channelled above, glandular-tomentose, with fulvous glands, prickly beneath. Leaflets 5 to 7, or sometimes 9, large, all petiolulate, terminal oval, rounded at base, 3–4 cm. long, elliptic-oblong, greyish pubescent above, softly villous beneath, and *covered with fine fulvous glands*, nerves salient, doubly dentate, with more or less open teeth. Stipules oblong, *villous above*, glandular-pubescent beneath. Auricles acute, erect or little diverging, gland-fringed. Peduncles solitary, or 2–4, more or less hispid with setaceous glandular spines, with oval bracts often foliaceous at apex, glabrous above, pubescent and scattered glandular beneath, usually longer than the peduncles. Calyx-tube subglobose, with setaceous gland-tipped spines. Sepals hispid-glandular, ending in a foliaceous,

weakly denticulate point, gland-fringed and a little puberulent, spreading in flower, then erect, two entire, three with some narrow straight linear lobes, covered with glands, salient in bud, and *shorter* than the corolla. Flowers fine rose, petals *not ciliate at the base*. Styles villous, numerous in a rounded head, shorter than the stamens, disc none. Fruit *red*, large, glabrous, hispid, crowned by the persistent sepals, pulpy from the beginning of September.—This rose differs from *R. pomifera*, of which it has the appearance, by its leaflets covered with glands beneath, its stipules pubescent above, its petals not ciliate, and its smaller fruit, red when ripe."

Specimens of this species agree so nearly with *R. pomifera* that I can see no justification for classifying it as a variety of *R. mollis*, as Mr. Ley at first did, but he now agrees with me in thinking it to be very near *R. pomifera*. The prickles sometimes have longish bases, and are somewhat curved, and the leaflets are more glandular beneath, but none of these characters bring it nearer to *R. mollis*. On the other hand, the leaflets in many of the specimens are thin in texture, and large, oblong, and parallel-sided, just as in *R. pomifera*, though forms with smaller or with more elliptical leaves are frequent. Its stipules seem to be *less often* pubescent above, instead of more often so than in that species, and its fruit is not any smaller. I cannot judge of its colour.

Crépin, in Bull. Soc. Roy. Bot. Belg. xxi. p. 102, says that it is nothing whatever but *R. pomifera* with fewer or finer stalked glands on the fruit, and that it would never have been created had not Déséglise made the mistake of supposing the leaflets of *R. pomifera* to be eglandular. Christ, in Ros. Schweiz. p. 81, remarks on the variability of the subfoliar glands in the two species, and says that he has type *pomifera* quite strongly glandular. Even Puget's own notes give no other tangible difference between the two. The ciliation of the petals in the group is a very unstable character.

There are three British examples in herb. Déséglise. Mr. Baker's No. 36 from between Thirsk and Woodend, N. E. Yorks, has stoutish considerably curved prickles, large elliptical acute leaflets, not at all densely tomentose, and scarcely at all glandular beneath. Stipules not broad, with quite acuminate, narrowly triangular auricles. Peduncles longish, fruit subellipsoid, sepals decidedly pinnate, spreading on young fruit, which the collector says is later in ripening than in *R. mollissima*. Every one of these characters points to its being a *tomentosa* form. It is certainly not *R. recondita* nor *R. pomifera*. Mr. Baker's No. 49, collected by Hailstone at Boniton Lynn, Lanark, of which there is also a specimen at Kew, is almost unarmed, or has rather short rather stout prickles, leaflets very large, broadly oval, quite thinly pubescent, but densely finely glandular beneath. Stipules very broad, with acuminate diverging auricles. Calyx-tube very small, ellipsoid. Though this is nearer *R. recondita* than No. 86, Mr. Baker may be right in referring it to *R. mollis*, and if not that it is a

tomentosa form. Dr. St. Brody's Painswick, Gloster, specimens labelled *R. pomifera* are rightly placed here by Déséglise, and Mr. Marshall's Tidenham Chase, W. Gloster, specimens belong here also.

Mr. Ley quotes fifteen vice-counties for *R. recondita*, but from his description and from the specimens I have seen so labelled by him, some of these are probably forms of *mollis*, and not of *pomifera*. There are specimens in herb. Bailey from W. Argyle and N.E. Kincardine, which are doubtless referable to this species.

Rosa mollis

Smith, Eng. Bot. t. 2459 (1812).

"Fruit globose, half as long as the segments of the calyx, bristly as well as the flower stalks. Prickles of the stems straight. Leaflets elliptical-ovate, downy on both sides."

Smith adds that he thought this different from *R. villosa* Linn. [*R. pomifera* Herrm.?], being of lower growth, with less elongate more ovate leaflets. Petals deeper red. Ripe fruit much smaller. One calyx-segment and no more is very often very distinctly pinnate. He thought it not very uncommon in England and Wales.

R. mollis has perhaps been more misunderstood in Britain than any other species in the subsection. That it should have been confounded with various species of the *Sherardi* group is not surprising, as the features of that group have not until recently been appreciated in Britain, but it has not always been correctly segregated from the *tomentosa* group. Some difficulty arises from the doubt which must exist as to the future direction of the sepals in most herbarium specimens, which are seldom collected in ripe fruit, and even in that state the sepals of the *Sherardi* group are mostly still adherent, but there should be little difficulty in separating *R. mollis* from the *tomentosa* group by these organs. In *R. mollis*, and indeed in the whole *pomifera* group, the sepals are long and narrow, much rounded on the back, so as to be almost folded longitudinally or involute, seldom much, and often not at all, pinnate, the pinnæ when present being usually narrow. Also they become quite erect and connivent, those of the *tomentosa* group seldom being more than spreading-erect. In *mollis* and its allies the sepals become incrassated at the base, and often assume the colour of the ripening fruit, while in the *tomentosa* group they are much thinner, and show signs of disarticulation soon after the petals fall. The features of the sepals of the *Sherardi* group are intermediate between those of the *pomifera* and *tomentosa* groups.

Besides its specific characters mentioned below, the earlier ripening of the fruit in *R. mollis* may assist in its discrimination, at least from the *Sherardi* and *tomentosa* groups; the date of gathering therefore is an important piece of information which should be noted. The very straight internodes also are almost always obvious in this group. Keller, however, remarks on the difficulty in separating *R. mollis* from *R. pomifera* on the one hand, and from *R. omissa* on the other, observing that Crépin

confounded it with both, while Christ thinks that *R. omissa* is merely glandular *mollis*. This latter view is clearly untenable if their specific characters are of any value at all. This expression of opinion from Keller is interesting, as he has not hesitated to create a large number of species and varieties of Central European roses on features which seem even less definite than those which separate *R. mollis* from its allies, but Mr. Ley, I think, is of opinion that well-defined *R. mollis* is not known, or is rare, on the Continent.

There are three specimens on the sheet in Smith's herbarium, of which the types quoted by him in the remarks following his description are Nos. 1 and 3. The first is cultivated from a Scottish specimen brought by Jackson, and the other a wild one from between Edinburgh and Ravelstone Wood. They both have small, aciculate, perfectly straight prickles, leaflets medium or small, oval or somewhat obovate, quite rounded at apex, densely finely and softly velvety above, more densely so beneath, eglandular except on some of the midribs. Primary teeth open and shallow, some of them with one or two conspicuous secondary teeth, but all with small fine glandular denticulations. Petioles very densely, but very finely pubescent, in No. 1 a good deal glandular and aciculate, in No. 3 much less so. Stipules broad, with broad shortly acute or cuspidate auricles, which do not appear to be incurved, but erect or spreading. Peduncles in No. 1 rather long, and fruit small and globose, both glandular-hispid. Sepals spreading, entire, densely glandular-hispid on back. Styles densely woolly. In No. 2 the peduncles are much shorter, fruit larger, sepals erect, subconnivent, slightly pinnate, densely glandular-hispid.

Mr. Baker's remarks in Review, p. 12, deserve to be reproduced:—"With us it [*R. mollissima*, i.e. aggregate *mollis*] is little liable to vary. The principal change is in the clothing of the leaves, which are usually soft and grey, and with very few glands beneath, but sometimes greener, harsher, and more glandular, and the same may be said of the sepals. From *R. tomentosa* the nature of the fruit furnishes the best character of distinction. Although they flower at the same time, this species ripens its fruit at least a month earlier. By the end of August its bright crimson globes, often gracefully pendent from the cernuous peduncles, are already a conspicuous object in the hedgerows. They soon grow pulpy in texture, the skin and juice having a pleasantly acid flavour, are crowned to the end by the truly persistent connivent and sparingly compound sepals, and deliquesce with the early frost. As in *R. tomentosa*, both naked and prickly-fruited forms are common. The ciliation of the petals, which is mentioned both by Déséglise and Fries as a character of *R. mollissima*, is quite unusual in our plant, and occurs also in undoubted *tomentosa*. In the latter the fruit is typically ovate, but so great is the resemblance between the two in other points that often dried specimens in flower are hardly distinguishable."

The following notes are drawn up from an examination of all

the available material which has been named by competent authors, but does not include Smith's own specimens, which have already been dealt with.

The bark is often dark shining brown as in *R. pomifera*, and the internodes are quite straight. The prickles also are much as in that species, but on the whole more numerous and rather longer, and sometimes slightly curved. Déséglise places several specimens with quite curved or even hooked and occasionally quite stout prickles to this species, in spite of the fact that they had been labelled *R. tomentosa* or some variety thereof by their collectors. I do not think these particular specimens should be referred to *R. mollis*, but have seen examples of undoubted *R. pomifera* with prickles equally hooked, so that such a feature is possible in *R. mollis*. The leaflets are about 1–1¼ in. by ¾–1 in., regularly oval or ovate, not parallel-sided, usually subobtuse or rounded, but fairly often subacute or even acuminate at apex, the base usually rounded, sometimes emarginate, more rarely somewhat narrowed. They are thick in texture, with the pubescence somewhat denser than in *pomifera*, but either quite eglandular, except sometimes on midrib, or only very finely and inconspicuously glandular, rarely with conspicuous glands, and very rarely with many. Toothing generally as in *pomifera*, but the teeth usually narrower and more directed forward, the secondary teeth often quite spreading, so as to make the serration look very irregular. Petioles as in *pomifera*, but the stipules decidedly smaller and narrower, and not incised, often pubescent both sides, glandular on back, but not densely so, or often eglandular. Auricles usually triangular or lanceolate acuminate, sometimes subdeltoid. Peduncles 1–3, usually shorter rarely longer than the fruit, densely hispid-glandular, but seldom aciculate. Very frequently some of the peduncles are cernuous. Fruit usually subglobose, ½ in. to ¾ in. each way, but often, especially the middle one of a cluster, quite obovoid or narrowed below, often even all quite ovoid, nearly 1 in. long by over ¾ in. broad, usually with scattered glandular hispidity, rarely aciculate. Sepals almost always decidedly pinnate, long, though not quite so long as in *pomifera*, but not otherwise differing therefrom in shape, direction, and curvature of back. Styles and disc as in *pomifera*.

Mr. Baker's No. 5, from Thirsk, has straight rather small but not very slender prickles, from rather long bases. Leaflets oval, rounded at apex, not very strongly biserrate, with a few fine subfoliar glands. Peduncles 1–3, not much glandular-hispid, shorter than or equalling the fruit, which is globose, or broadly ovoid, glandular-hispid, shorter than the long, narrow, erect, connivent, entire sepals. No. 6, from Thirsk, has slender, slightly curved, rather longer prickles. Leaflets rather decidedly glandular beneath. Peduncles short, fruit as last, sepals decidedly pinnate. Déséglise objects to both of these on account of the subfoliar glands, but has specimens quite as glandular in his own herbarium, and a specimen of *R. mollissima* at Kew collected by Fries is even more so. *R. mollissima* Fries is regarded by common consent as

synonymous with *R. mollis* Sm. Several British specimens of *R. mollis* at Kew have conspicuous subfoliar glands. Some of these no doubt should be referred to *R. pseudo-rubiginosa* Lej., but that species is distinguished by other features than by glandular leaflets, so that unless a new name be created, we must allow such leaflets to occur occasionally in *R. mollis* Sm. Mr. Ley, however, confines the name strictly to plants with eglandular leaflets, and has referred some of the glandular ones to *R. recondita* Pug., which really differs essentially.

I am unable to give the distribution of *R. mollis* in Britain, but it is common enough in Scotland and certainly thins out rapidly southward. Mr. Ley says records south of Monmouth must be accepted with caution, with which I quite agree.

Rosa villosa var. cœrulea

Woods in Trans. Linn. Soc. p. 192 (1817).

"Fruit and peduncles nearly smooth. Flowers blood-red. The glaucous waxiness of the young shoots is very conspicuous and very beautiful in this variety. The leaves are more glandular beneath, the bush in general is smaller and the habit more slender than *a*."

Mr. Baker, in Monogr. p. 214, says of it:—"Leaflets softer and greyer than usual, with very few glands or aciculi on the petioles; the points of the sepals often very leafy; the calyx-tube and fruit broader than deep and perfectly smooth, the fruit pendent; the peduncle with fewer and weaker setæ and aciculi than usual, and in extreme cases quite naked."

Usually this plant is accepted as covering forms of *R. mollis* with the fruit, though not always the peduncles, smooth or nearly so, but smooth fruits may be found on the same bush as hispid ones. Woods's own description precludes us from restricting the name to extreme forms with all the fruits smooth, because he says "nearly smooth," and though Mr. Baker says "perfectly smooth," his own specimens show that they are not so. Woods mentions subfoliar glands, but they may occur in type *mollis* quite irrespective of the fruit and peduncle clothing. There is left only the habit, and very glaucous shoots. The former character is almost impossible to see in herbaria, while the latter becomes obscured, so that diagnosis becomes difficult. Mr. Ley relies partly on the smallness of the fruit, which is borne out by Woods's and Baker's specimens, but is not mentioned by either in their diagnoses.

A specimen from Woods at South Kensington has its leaflets densely but very finely glandular; peduncles of moderate length, quite smooth; calyx-tube quite small and smooth. Sepals entire, scarcely glandular on back. Mr. Baker's No. 7, from Seaton Delaval, Northumberland, in herb. Déséglise, has broadly oval obtuse leaflets, rather thinly hairy and doubtfully even microglandular beneath. Fruit small, quite globose, $\frac{1}{3}$ in. each way, smooth except for a few setæ quite at the top. Sepals long,

linear, with foliaceous tips, pinnate, glandular on back. The same number in the British collection has its leaflets plainly but thinly glandular beneath; the fruit is aciculate on the whole upper half or two-thirds.

Rosa Grenierii

Déséglise, Essai Monogr. p. 128 (1861).

"Shrub with slender prickles, compressed at base, long, straight. Petioles tomentose, glandular, prickly beneath. Leaflets 5–7, *oval elliptical, obtuse or acute, firm, greenish*, softly villous above, *greyish* tomentose beneath with *shining villosity*, nerved, doubly dentate, with ciliate glandular teeth, the lateral petioluled, the terminal rounded at base. Stipules glabrous above, tomentose beneath. Auricles acute, diverging. Peduncles short, solitary or in a small corymb, hispid, with bracts at base pubescent above, tomentose and scattered glandular beneath, longer than the peduncles. Calyx-tube *subglobular, hispid with small setaceous spines ending in a gland*. Sepals glandular, tomentose on edges, lanceolate, spatulate at apex, entire or two with 1 or 2 short lobes, reflexed in flower, then erect, persistent. Styles short, villous. Flowers *small, rose, yellowish in middle* (I have not seen them ciliate). Fruit *ovoid-globular, red, a little attenuate at base*, hispid, crowned by connivent persistent sepals.—Differs from *R. pomifera* in its smaller oval elliptical not oblong lanceolate leaflets, with stronger more shining villosity; calyx-tube hispid with fine setæ, which are less numerous and half shorter; fruit smaller, red, not reddish violet; from *R. resinosa* [*R. resinosoides* Crép.] in leaflets eglandular beneath; calyx-tube subglobular, hispid with small setaceous spines; fruit ovoid-globular, a little attenuate at base."

When Déséglise republished the above description in Rev. du Sect. Toment. five years later, he called the fruit "ovoid," without any reference to attenuation at the base, and omitted the comparison with *resinosa*.

This species is universally recognized on the Continent as a variety of *R. pomifera*, yet the very differences from that species enumerated by Déséglise, with the exception of the shining villosity, are those which distinguish *mollis* therefrom, moreover the specimens I have seen of *R. Grenierii* recall *R. mollis* rather than *R. pomifera*. It is chiefly for this reason, and on account of the existence of several other intermediates, that I decided to unite *mollis* and *pomifera* in one group. Crépin, in Bull. Soc. Roy. Bot. Belg. xxi. p. 104, says *R. Grenierii* is simply a series of forms between the two, often with fine subfoliar glands, a feature not confirmed by Déséglise's specimens, and expressly barred by his description. It seems to me to be distinguishable from *R. mollis* solely by its more unequal prickles and subentire sepals. Perhaps broader stipules, with deltoid auricles, rather smaller more finely serrate leaflets, and less deep rose flowers are features which may assist in its diagnosis. It occasionally runs into forms with rather narrowly elliptical leaflets, narrowed at each end.

This species is not mentioned by Mr. Ley, though Mr. Baker thought it our commonest form of *R. mollis*, but I have only seen one British specimen so named by Déséglise, *viz.* one by Webster from Scarborough, which agrees very well with the above description and notes, but it has even smaller leaflets, the largest being only 1 in. long by $\frac{5}{8}$ in. wide. It seems near *R. minuta* Bor., which is nothing but a small-leaved form.

Rosa pseudo-rubiginosa
Lejeune, Fl. Spa, p. 229 (1811).

"Ovary rounded, hispid. Peduncles hispid. Stem and petioles with recurved prickles. Leaves oval-oblong, glandular hairy and rusty (*rouillés*) beneath, and on the teeth. Flowers rather deep rose."

Crépin says that this is synonymous with his *R. Arduennensis*, of which he gives the following description in Bull. Soc. de l'Acad. Roy. de Belg. 2me sér. xiv. p. 101 (1862):—"A low shrub, 1–1½ metres. Stems not recurved at top, those of the year straight, glaucous green, slightly violet. Prickles few, equal, straight, *horizontally spreading*, *the upper sensibly up-curved*, *compressed*, with narrow disc. Branches with brownish bark, their prickles with roundish base, *straight*. Leaves with 2–3 pairs of leaflets, petioles pubescent, glandular and prickly. Leaflets thin, petioluled, oval, oval-elliptic, or oval-oblong, rounded at base, more or less obtuse, or more or less attenuate, acute at apex, *almost glabrous both sides*, the lower glaucescent green, with numerous glands, which are *yellowish*, *resinous*, and with a pronounced odour, *the upper usually covered with resinous glands*, with glandular compound teeth (4-6 dentate). Stipules glabrous, glandular beneath, with crisp gland-ciliated edges, the lower narrow, with auricles little diverging or approaching the petiole, *the upper very dilate*, *with elongate obtuse or abruptly acuminate auricles*, *parallel or approaching the petiole*. Bracts *very broad*, equalling or a little shorter than the peduncles. Flowers solitary or 2–3. Peduncles long and charged with numerous glandular setæ, longer than their diameter. Calyx-tube globular or ovoid, glaucescent green, hispid-glandular. Sepals equalling the corolla, rising immediately after the flowering, with foliaceous apices, two simple, the others pinnatifid, very glandular on the back, pubescent within and on the edges. Corolla large, *bright rose*, *red in bud*. Petals emarginate, rarely gland-ciliate at tip. Styles salient, pubescent. Fruit globular or ovoid, rounded at base, usually a little attenuate at apex, glaucescent throughout ripening, at length *orange-red*, flesh not pulpy, more or less sugary, crowned till it falls by the *persistent* erect or connivent sepals. Carpels very numerous, small, oblong, those in the centre very longly stipitate.—Differs from *R. mollissima* in its prickles being much longer, slender, always straight, even on flowering-branches, horizontal or up-curved (those of *R. pomifera* and *R. mollissima* are small, inclined or a little hooked with large bases), by its thin

leaflets almost glabrous beneath and glandular both sides, and by the form of its upper stipules."

It will be noticed that while Crépin lays the very greatest stress on the prickles being straight, horizontal or up-curved, Lejeune says they are recurved, so that had not Crépin expressly stated that his species was synonymous with that of Lejeune, the contrary might have been suspected. I have seen no examples named by Lejeune, so cannot say whether they agree in other points with Crépin's description.

This species is incorrectly placed by Mr. Ley under *R. omissa*. Crépin (*l. c.*) says that *R. pomifera*, *R. mollissima*, and *R. arduennensis* must be classed together, either as separate species of one group, or as varieties of one species, differing from *R. tomentosa* [*R. omissa* had not at that time been described] in their straight stems, not recurved at the top, and sepals persistent till the fruit itself falls, not simply rising, marcescent, and then caducous, also by their petals being of deeper colour. He admits, however, that he only knew *R. pomifera* from a specimen in his garden, but considered that it differs from *R. mollis* in its size and in its subfoliar glands, which Déséglise had overlooked.

There are two specimens in herb. Déséglise and two at Kew collected by Crépin. They have rather few, long, very slender, subulate, very straight prickles, often in pairs, the uppermost often *inclined* upwards, not *up-curved*. Leaflets medium, oblong elliptical, subobtuse or rounded at apex, very thinly and finely hairy above, not much more so beneath, and chiefly on midrib and veins, always with some and often many conspicuous glands above, always densely and conspicuously glandular all over the lower surface, biserrate, the primary teeth fine, the secondary coarse. Petioles with short fine scanty pubescence, densely glandular (one specimen nearly eglandular), with often many, but always very short, fine acicles. Stipules usually densely glandular on the back, but not much hairy. Auricles rather long and broad, but quite acuminate. Peduncles about equalling or a little longer than the fruit, densely glandular-hispid. Fruit broadly ovoid-suburceolate, considerably glandular-hispid. Sepals erect, connivent, persistent, much or moderately pinnate, often with very broad, foliaceous, deeply incised terminal appendages, very glandular-hispid. Styles white-woolly.

Crépin's specimens confirm his description, and show that this species is one that has rather few but remarkably long, straight, slender prickles, and leaflets unusually little hairy for the group, but if we restrict the name to such plants, as I think we ought to do, we must exclude therefrom all those which have very glandular leaflets, often glandular on both sides, but densely tomentose. These must not be placed to *R. recondita* unless they have the other characteristics of that species, and although *R. mollis* may have its leaflets more or less glandular, I doubt whether Smith ever meant them to be densely so; nor must they be placed to *R. resinosoides* Crép., which is not one of the *pomifera* group. On the other hand, Crépin, in Primit. Monog. p. 97

(1869), gives his opinion that the degree of pubescence on the leaflets is of little value, so that perhaps for the present *R. pseudo-rubiginosa* Lej. may be permitted to include forms with densely tomentose as well as thinly pubescent leaflets, but I think a new name will have to be found for the former, which certainly occur in Scotland, if not in England. If Crépin's principle that pubescence is of little importance be accepted, some of our species in other groups must disappear.

Déséglise, in Cat. Raisonné, quotes a Thirsk specimen by Mr. Baker, but has no specimen of it in his herbarium. There is, however, at Kew a specimen labelled, "*R. mollissima*, with petals gland-ciliate. Hedges at Thirsk. This is probably the plant referred to by Déséglise as *R. arduennensis*." It has very fine slightly curved or very straight prickles, from quite flat, oval bases. The leaflets are medium, rounded at apex, moderately hairy both sides, and glandular beneath, though not very densely so, and some nearly eglandular. Peduncles glandular-hispid, about equalling or slightly longer than the ovoid glandular-hispid fruit. Sepals rather short, erect, connivent, subentire. It is much like Crépin's own specimens, but the leaflets are decidedly more hairy and less glandular.

The synonymy with *R. villosa* var. *suberecta* Woods, quoted by Mr. Baker in Monogr. p. 214, is not now accepted as correct.

Foreign Species of the Group R. pomifera.

R. resinosa Sternb. is quoted by Baker, in Monogr. p. 211, as a synonym of *R. pomifera* Herrm., which it certainly approaches, to judge from Keller's description in Asch. & Graeb. Fl. Mitteleurop. vi. p. 67, but differs in its much wider-spaced, very silky leaflets, glandular beneath, very long peduncles, and small fruit and flowers. It is, however, an Eastern species not likely to occur in Britain.

R. Andrzeiovii Stev. This is mentioned in Baker's Monogr. as one of the segregates which make up our *R. tomentosa* Sm., but it has been regarded by Mr. Ley as a species or variety, widely spread in Britain, of the *Sherardi* group. There is, however, no doubt whatever that it is a *pomifera* form near *R. mollis*, not a *tomentosa*, nor a *Sherardi*, and I think Mr. Ley now agrees to this. Steven's description (ex Besser, Enum. Plant. Volk. Podol., &c., p. 19, 1822) is inconclusive, but Déséglise's fuller one lays stress on the persistence of the sepals; moreover, specimens named by Besser at Cambridge, at Kew, also on the Continent in Sieber's herbarium, and at Berlin all bear this out. Crépin saw the two latter, and formed the opinion that Besser applied the name to various forms of *R. mollis* Sm. Rouy considers that Déséglise's *R. Andrzeiowskii* (as he spells it) is not that of Besser, but is *R. tomentosa* var. *globulosa* Rouy, but seeing that the latter variety has its sepals persistent only up to the coloration of the fruit, this view hardly seems tenable, because Déséglise gives persistent sepals to the plant he calls *Andrzeiowskii*. Mr. Ley thinks that our forms

which he has been naming *R. Andrzeiovii* are sufficiently distinct from other members of the *Sherardi* group to merit a new name. I have not seen enough of them to express an opinion on this point, nor do I know more of Rouy's var. *globulosa* than appears in his key. Beyond all this, Steven's *Andrzeiovii* is an Eastern European species, unlikely to occur in Britain.

GROUP OF ROSA SHERARDI.

Since the recognition of *R. omissa* Déségl., or at least forms of it, as a British species, the desirability of segregating species and varieties, which have affinity therewith, from the groups of *R. pomifera* and *R. tomentosa* has become apparent, but as *R. Sherardi* Davies, one of its members, is a much older name, it is proposed to use it at the head of the group. *R. farinosa* Bechst., one of our supposed British species, actually antedates *R. Sherardi* by three years, but that is a somewhat obscure and aberrant species, of which I have seen no authentic material, moreover it is usually regarded on the Continent as belonging to the *tomentosa* group, though its affinities seem much stronger with the present one.

The leading features of the group of *R. Sherardi* are a low, compact, rather stiff habit, just intermediate between that of the *R. pomifera* and *R. tomentosa* groups. The internodes are seldom quite straight, but they are not as a rule obviously flexuose as in *tomentosa*. The prickles are slender or moderately stout, straight or somewhat falcate, very rarely hooked, and even then less stout than they frequently are in the next group. Its leaflets are usually densely and softly tomentose, but subglabrous varieties occur. They vary much in shape, but in general are rather close set and somewhat obtuse, and are bluish green in colour. The stipules have more acuminate auricles than in the *pomifera* group, and the upper ones are not falcately incurved. Normally the peduncles are short, but several forms occur which have them long. The sepals are somewhat pinnate, narrow, and rounded on the back, spreading-ascending or even erect and connivent after flowering, persistent till the fruit is ripe, then deciduous. Occasionally some of the sepals may fall before the ripening of the fruit, but never before it is fully red. The styles are villous, rarely only hispid.

Though the above definitions are drawn up to include the main features relied upon by Keller and Rouy to distinguish this group, it certainly appears to cover some species and many individuals which are assigned by Continental authors to the group of *R. tomentosa*. In our British list, the leading species, *R. Sherardi* Davies, comes under this category, further remarks on which will be made under that species, while of the more obscure forms, *R. farinosa* Bechst. and *R. cinerascens* Dum. are usually classified as *tomentosa* forms on the Continent. Apart from the habit, which is not always determinable in a herbarium specimen, the best and most easily observable feature is the persistence of the

sepals, that is, if the specimen be sufficiently advanced. I have not learnt to predict with confidence, from a specimen in which the fruit has not begun to turn colour, whether the sepals are going to fall early or late, but Mr. Ley tells me he seldom finds any difficulty in doing so. If his diagnoses are correct, I believe the group of *R. Sherardi* will prove to be our largest one in the subsection, not only in species and varieties, but also in individuals.

I have not been able to follow the discrimination I have just referred to, which is used by foreign authors in placing some of the forms to the *tomentosa* group, which certainly have sepals erect and persisting until the ripening of the fruit, and by description have also the habit of the *Sherardi* group, but I think that at least long peduncles, *i. e.* considerably longer than the fruit, seems to be one of the guiding factors. This, however, seems to me an unimportant feature as compared with the persistence of the sepals, but this point will be referred to again in the notes on *R. tomentosa* Sm.

At the best, the group is not a very well-defined one, as might be expected from its intermediate position. *R. omissa* Déségl., its typical species, though not its oldest one, is very near *R. mollis* var. *cærulea*, while forms with the sepals more pinnate and flatter on the back, or with less woolly styles, show an approach to the *tomentosa* group, especially when combined with more widely spaced, narrower and decidedly acuminate leaflets, as in some of its varieties.

Key to British Species.

1	Leaflets simply serrate	*R. cinerascens* Dum.
	Leaflets biserrate or triserrate	2
2	Fruit and peduncles smooth	*R. farinosa* Bechst.
	Fruit usually and peduncles always hispid-glandular	3
3	Leaflets eglandular, or only very finely and inconspicuously glandular beneath	4
	Leaflets with conspicuous, though sometimes only few subfoliar glands	6
4	Prickles moderate, straight or nearly so (see footnote p. 53)	*R. omissa* var. *submollis* Ley.
	Prickles stoutish, decidedly curved or falcate	5
5	All the fruits globose or broadly ovoid	*R. Sherardi* Davies.
	Outer fruits subglobose, the central always more or less obovoid	*R. tomentosa* var. *pseudo-mollis* E. G. Baker.
6	Styles hispid, not villous. Leaflets narrow, subglabrous, or thinly pubescent	*R. tomentosa* var. *Woodsiana* Groves.
	Styles villous. Leaflets broad, densely pubescent or tomentose	7
7	Prickles rather short, some at least strongly hooked	*R. tomentosa* var. *uncinata* Lees.
	Prickles more or less long, straight, or curved, never hooked	8
8	Prickles long, nearly straight. Petioles very strongly armed with pricklets, aciculi, and stalked glands. Bracts and stipules often red. Sepals long, dark, spreading, much pinnate. Fruit ovoid, hispid	9
	Not as above	10

9	Leaflets tomentose	*R. suberecta* Ley.
	Leaflets glabrous or nearly so	*R. suberecta* var. *glabrata* Ley.
10	Prickles straight, or only slightly curved	11
	Prickles falcate	*R. tomentosa* var. *pseudo-mollis* E. G. Baker.
11	Peduncles as long as or longer than fruit. Leaflets more or less densely glandular beneath. Fruit considerably hispid, all ovoid or only subglobose	*R. resinosoides* Crép.
	Peduncles shorter than fruit. Leaflets less glandular beneath. Fruit little or not at all hispid, the outer globose, the central pyriform	*R. omissa* Déségl.

Rosa Sherardi

Davies, Welsh Botanology, p. 49 (1813).

"A wild rose with softly hirsute leaf, round glabrous fruit, calyx and peduncle hispid.—The spines of the branches are larger and more bent [than in *R. villosa*], the flowers more numerous, and frequently arranged in an umbel, the fruit smaller, more globular, glossy and without bristles. I thus define it:—Rose with glabrous globose fruit, peduncles and calyx hispid. Stem-prickles subhooked, leaflets elliptic, tomentose both sides."

Davies adds that the glandular hispidity of the peduncles and fruit varies. He records *R. tomentosa* Sm. next to it, so obviously meant to keep them distinct but does not emphasize the points of difference. He remarks that he is convinced that his species is not a *villosa* form.

Smith described this as *R. subglobosa* in Eng. Fl. ed. 1, vol. ii. p. 384, but, recognizing the identity of his species with Davies's, corrected the name in his second edition to *R. Sherardi* Davies (see Journ. Bot. 1909, p. 353). His description is as follows:—"Fruit globular, abrupt, somewhat bristly. Calyx copiously pinnate. Prickles conical, hooked, compressed. Leaflets elliptical, acute, downy both sides.—A stronger plant than the last [*R. tomentosa*], with stout round branches. Prickles chiefly in couples under the leaves and younger branches, hooked, conical, tapering gradually from a very broad base, all in some degree compressed laterally, but particularly so on the young vigorous shoots. Leaflets 5 or 7, elliptical, and rather broad, but more or less acute at each end, hoary, soft and downy on both sides, doubly serrated. Foot-stalks downy, prickly, slightly glandular. Stipules downy, acute, fringed with glands. Flower-stalks 1 to 8 or 9, the more numerous the shorter, beset with glandular bristles, mostly bracteated, with the uppermost leaflets stipular, which are ovate lanceolate, acute, glandular, and downy. Tube of the calyx large, tumid, globose, abrupt, often slightly depressed, sometimes a little elongated at the base, variously besprinkled with bristles, but sometimes almost naked. In a half-ripe state its surface is corrugated from the projection of the numerous seeds, and has a purplish olive hue. It then much resembles a half-grown bullace plum. I have not seen the ripe fruit or the flowers. The segments of the limb of the calyx are expanded, very rough with bristles and stalked glands, and copiously pinnate

in the manner of *R. tomentosa*. The whole plant, except the prickles and calyx, bears more resemblance to *R. villosa* than to *R. tomentosa*, and is particularly remarkable for the large globular half-ripe fruit."

There is a specimen from Davies, which is his type, from Anglesea, at South Kensington. It is a small piece of a flowering-shoot in fruit, and it therefore shows no stem prickles. The prickles on this shoot are very slender, straightish or slightly curved, but of course would not be typical of those on the stem. Leaflets rather small, regularly oval or broadly elliptical, thinly and finely but quite softly pubescent above, the under side scarcely visible but appears to be densely tomentose and eglandular. They are finely, sharply, but not very fully biserrate. Petioles densely tomentose, very densely glandular, with few small prickles. Stipules rather densely conspicuously glandular on the back. Peduncles in a cluster of four, ½ in. to ⅔ in. long, about equalling fruit, glandular-hispid. Fruit subglobose, very slightly glandular hispid. Sepals spreading or spreading erect, more or less glandular and pinnate. Wilson's specimen on the same sheet has shorter peduncles, more glandular and more pinnate sepals, quite ovoid fruit, and more curved prickles. He thought these characters and the more persistent sepals and globose fruit formed the chief distinction from *R. tomentosa*, though the fruit in this specimen is decidedly ovoid.

Smith's specimens (of *R. subglobosa*) have quite stout somewhat hooked stem-prickles. The leaflets are broadly oval, very densely pubescent both sides, eglandular beneath. Some of the stipules are quite glandular on the back and some naked on the same specimen. The fruit in one specimen is smooth and quite globose, but in the other it is somewhat glandular-hispid and quite decidedly ovoid. The sepals in both are spreading. There is a sheet in Smith's herbarium containing three or four specimens collected by Davies in Anglesea in 1802 (eleven years before he described *R. Sherardi*). The label by Davies is marked *R. mollis* var. *cærulea*, but one of the specimens differs from the others, and has been marked by Smith "*R. subglobosa*," doubtless quite correctly. It has decidedly ovoid, somewhat glandular-hispid fruit.

There is no doubt that *R. Sherardi* is very distinct from the *tomentosa* group. Davies's own specimens show the sepals to be too persistent, though they are not sufficient to show the habit, but the fact that he had confounded some of his own specimens with *R. mollis* var. *cærulea* Woods seems to warrant the assumption that his species was at least as near *mollis* as *tomentosa* in appearance and habit. Wilson specially remarks on the greater persistence of the sepals as a distinctive feature from *R. tomentosa*, and there is no reason to suppose that Smith was mistaken in identifying his *R. subglobosa* with *R. Sherardi*, while his remark that his species bears more resemblance to *R. villosa* than to *R. tomentosa* seems to confirm the opinion that it must be kept distinct from the *tomentosa* group.

But British authors, who have overlooked the name of

R. Sherardi, have applied the name of *R. subglobosa* Sm., which is synonymous, to globose-fruited forms of the *tomentosa* group, as well as to the true species of Davies, and have also so labelled plants with obvious subfoliar glands, which, if not inadmissible, are at least very untypical. Continental botanists, no doubt misled by British opinion, have also placed *R. subglobosa* Sm. under *R. tomentosa*, though I find the majority of the specimens referred thereto are good *R. Sherardi*. It is the presence of such examples that obscures the Continental line of division between the two groups.

R. Sherardi is recognizable by its habit, also by its rather stout decidedly falcate prickles, thick densely tomentose leaflets, typically, if not always eglandular, globose or broadly ovoid fruit, usually in small clusters, the central ones not appreciably obovoid or pyriform, on moderately long peduncles, and spreading erect decidedly pinnate sepals, which persist till the fruit ripens. Its styles are villous. But the five species which follow differ only slightly from it. *R. omissa* Déségl. differs in its subfoliar glands, straighter more slender prickles, shorter peduncles, and pyriform central fruit. Var. *submollis* Ley is even nearer, and hardly differs but by its straighter prickles and more ovoid fruit. Var. *pseudomollis* E. G. Baker has somewhat more falcate prickles, slightly glandular leaflets, and more ovoid fruit. Var. *uncinata* Lees is also very near, and differs chiefly in its very hooked though not stout prickles and glandular leaflets. *R. resinosoides* Crép., according to its author's latest views, is simply long-peduncled *omissa*.

Many of the plants labelled *R. Andrzeiovii* Stev. on the Continent are probably referable to *R. Sherardi*, which will I think prove to be a common and generally distributed species.

Rosa omissa
Déséglise in Billotia, p. 47 (1864).

"Shrub 1–1½ m. high, forming a dense *very tufted bush with a greyish look*, branches usually flexuous. Prickles compressed, dilated in a disc-shape at base, long and straight. Petioles tomentose and scattered glandular, prickly beneath. Leaflets 5–7, all petioluled, the terminal a little rounded or narrowed at base, *oval-elliptical*, rounded at both ends, or oval and *ending in a short point*, greyish pubescent or tomentose both sides, *scattered glandular beneath*, doubly dentate, ciliate, with glandular secondary teeth, midrib with scattered glands. Stipules glabrous above, pubescent and scattered glandular beneath, with acute diverging auricles. Peduncles very short (at most 1 cm. long), hispid-glandular, solitary or 1–4, *quite hidden* by an oval acuminate bract which is glabrous above, pubescent and scattered glandular beneath, the outer peduncles with an extra very small bract. Sepals short, oval, appendiculate and ciliate at tip, glandular, two entire with tomentose edges, three pinnate with gland-fringed appendages, salient in bud, shorter than the corolla, reflexed in flower,

then erect connivent. Calyx-tube *glabrous*, *obovoid*, attenuate at base. Styles villous. Disc short and little salient. Flowers fine rose. Fruit *large*, red, glabrous, rounded at apex, sensibly attenuate at base, *assuming a pyroid form*, crowned till it is ripe by the sepals which eventually fall.—It differs from *R. cuspidata* in its habit, its leaflets not being oval-lanceolate, pubescent, tomentose on both faces, peduncles quite short, hidden by bracts, sepals shorter than the corolla, calyx-tube glabrous, flower fine red, fruit larger, obovoid, pyriform, crowned by sepals; from *R. Andrzeiouskii* in its less stout prickles, leaflets with glands beneath, peduncles very short, hidden by bracts, calyx-tube glabrous, flowers fine rose, fruit larger glabrous, sepals not persistent after fruit ripens; from *R. mollissima* in its leaflets being scattered glandular beneath, calyx-tube obovoid glabrous, sepals shorter than corolla, petals not ciliate, fruit red, obovoid pyriform. Its fruit, its leaflets glandular beneath, its very short peduncles and bracts, its fine rose flowers easily distinguish it from *R. tomentosa* and *R. subglobosa*."

Déséglise has about thirty sheets in his herbarium. Regarding them comprehensively, together with those at Kew, the species appears to be distinguished by the following characteristics. The prickles are very similar to the curved ones of *R. mollis*. They are seldom quite straight, almost always somewhat curved, but hardly falcate and never hooked. They are frequently, though not always, stouter towards the base than in *mollis*, and the base may be either rounded or elongate. Leaflets just as in *mollis*, but on the whole not only a little smaller but somewhat narrower in proportion, less often obtuse or rounded at apex, and more often quite acute but not acuminate, also less rounded below; clothing also as in *mollis*, but as a rule with subfoliar glands, sometimes many, and always at least on secondary nerves, though the glands are often small and fine. Toothing perhaps a little finer, but very like that of *mollis*. Petioles perhaps more often with small prickles, their glands always shortly stipitate or subsessile; stipules broad with broadly triangular, or more often acuminate auricles, often quite dentate on the edge, often hairy above, and densely glandular on the back. Peduncles 1 to 4, often equalling and quite usually half to three-quarters as long as the fruit, not often less, so that Déséglise's specified length of 1 cm. is rather an average than a maximum, as he states. They are rather densely hispid-glandular, often rather strongly so, so as to be subaciculate. Bracts often very broad but *not* as a rule hiding the peduncles. Fruit subglobose, the central one of a cluster very often more or less produced below into an umbo at the insertion of the peduncle, but hardly pyriform, quite often slightly but seldom much hispid-glandular. Sepals hardly differing from those of *mollis*, except in being shorter, seldom longer than the fruit. Only four specimens have ripe fruit, the date of gathering varying from Sept. 4th to 20th. On these, as well as on the whole of the other specimens, all the sepals persist, either erect or spreading. Styles like those of *mollis*, disc quite decided.

The leading features of the above are the somewhat curved prickles, short peduncles, short sepals, and central fruit somewhat produced below, so as to be subpyriform. The habit and less persistent sepals also help to separate it from *mollis*, but the latter almost invariably remain till the fruit is quite ripe.

Crépin says that it has the facies and bluish foliage of *R. mollis*, to which group foreign botanists formerly referred it, but all modern specialists agree that its affinities are rather with *R. tomentosa*, from which it differs in its less acute leaflets, with more prominent secondary nerves (he does not mention glands), short peduncles, bright rose corolla, and, above all, by its sepals not disarticulating till the fruit is fully ripe. He thinks that in Britain *R. omissa* has frequently been confused with varieties of *R. mollis*, and in a later note (1892) he says that he has not seen British *omissa*, but that it might be found labelled *R. cuspidatoides* Crép., though this does not seem very probable, as that is one of the true *tomentosa* subgroup with deciduous sepals.

R. omissa is certainly a difficult species, unless we allow a good deal of departure from Déséglise's description. I have seen specimens from Mr. Barclay which certainly belong to this group, and come near this species. Their sepals are in most respects those of *mollis*, namely erect, connivent, narrow, much rounded on back, and often simple or nearly so, and even become incrassated and scarlet at the base. Most of them, though not quite all, persist till the fruit ripens. The peduncles, however, are long. The sepal characters are strongly suggestive of *mollis*, from which group Mr. Barclay says the habit at once distinguishes them. He also tells me that bushes apparently identical in all other respects have in some their sepals deciduous when the fruit is plainly unripe, although on the same bush some of them remain till the fruit ripens, while in others all or most of the sepals remain till after the fruit is fully ripe. I fear that the character which is generally accepted as the fundamental one by which we may distinguish the *Sherardi* subgroup from those on either side of it does not always stand the test of examination, but, after all, no single character in the genus ever seems to be quite conclusive.

Mr. Ley records *R. omissa*, though rarely, from some sixteen English, Welsh, and Scotch vice-counties, as far south as Montgomery, also one Irish one. I have not myself seen a specimen I can confidently refer to the typical plant, but do not wish it to be inferred that I have any doubt as to its existence in Britain.

Rosa omissa var. submollis

Ley in Journ. Bot. 1907, p. 205 (as a species).

"Bush less robust than in the preceding [*R. mollis* Sm.], with strong arching surculi. Very near *R. mollis*, with the thorns equally narrow-based but rather shorter and rather more curved; the leaflets broadly elliptic, hairy beneath; the peduncles long or short, always straight; the sepals suberect in fruit and persistent

until the fruit has changed colour, but finally caducous; the fruit large, ovoid, the primordial pyroid, ripening later."

Mr. Ley first described this as a species, but subsequently decided that it did not deserve specific rank, with which I quite agree. He reduced it to a variety of *R. omissa* in Lond. Cat. ed. 10, which is a far better arrangement.

I have seen some fifteen or twenty sheets of var. *submollis*, which have been lent to me from their herbaria by the kindness of Mr. Ley and Mr. Bailey. Mr. Ley tells me that he has described from all these collectively, and has not a defined type, but, as is usually the case, the more specimens one considers the wider the ground covered, so I find it difficult to give a comprehensive view of the whole without unconsciously departing from the description intended by the author.

Their prickles are rather short to moderately long, usually slightly conical, but not stout, either straight and horizontal or often somewhat declining, or more rarely directed upwards, or else and perhaps nearly as often somewhat curved, though hardly falcate. Those on the barren shoots, and on the branches of the year which often spring from the flowering-branches, are quite frequently decidedly stout and quite falcate, but these must not be taken as typical. The leaflets are usually elliptical rather than oval, often rather narrowly rounded at the base and acuminate at the apex, not very close set, eglandular on the back, or very rarely glandular on the secondary nerves, not very strongly biserrate, *i. e.* the secondary teeth not numerous, and often not gland-tipped. Petioles rather densely tomentose, usually though not always considerably glandular, and moderately prickly. Stipules rather broad, with long acuminate auricles. Peduncles solitary or in threes, as long as or rather longer than the fruit, but sometimes decidedly shorter, especially the primordial, usually glandular-hispid, but Mr. Ley includes several forms with them perfectly smooth. Fruit of medium to rather large size, ovoid or somewhat pyriform, smooth. Sepals spreading erect, rarely connivent, some of them usually with some short narrow pinnæ, persistent on ripe fruit till about the middle of September.

This variety certainly has a very great superficial resemblance, in the herbarium at least, to *R. mollis*. Except that the sepals of var. *submollis* are more spreading, and rather shorter, dried specimens would be extremely difficult to separate. I can see no appreciable difference in the prickles. Normally those of *R. mollis* should be quite straight, but forms with them slightly curved may be found, and as in var. *submollis*, those on the barren shoots are often much stouter and somewhat falcate. The prickles of *submollis*, though described as rather more curved than in *mollis*, are not so in the specimens examined; moreover, Mr. Ley tells me that he distinguishes his variety from var. *pseudo-mollis* E. G. Baker by its quite straight prickles. The leaflets are, on the whole, rather narrower than in *mollis*, though many forms of the latter have them quite elliptical. Its fruit is smooth and ovoid, while that of *mollis* is usually hispid or even aciculate, and

normally globose, though Mr. Barclay has sent me a series with them quite ovoid.

In spite of these similarities in the herbarium, Mr. Ley considers that the habit will always separate var. *submollis* from *R. mollis* in the field, the former being less rigid and less robust, though not so lax and arching as in the *tomentosa* group. Its fruiting peduncles, moreover, are always straight, some at least of those of *R. mollis* being curved. The straight or nearly straight prickles and large ovoid fruit distinguish it from *R. Sherardi*, its eglandular leaflets and straighter prickles from var. *pseudo-mollis* and *R. omissa*, while there is little else but its eglandular leaflets to distinguish it from *R. resinosoides*.

Rosa tomentosa var. pseudo-mollis

E. G. Baker in Journ. Bot. 1892, p. 341.

"Stem short, suberect, prickles slightly or sometimes decidedly curved, leaves intensely downy, covered with dense pubescence, with hardly any glands on the under surface, doubly serrated; pedicels straight, hispid, fruit subglobose or ellipsoidal, not ripening in the Midland counties till the end of September; three sepals more or less pinnately divided; sepals not leafy at the point, glandular at the back, spreading, deciduous."

This variety has appeared under three names. Its author placed it as a variety of *R. tomentosa*, which was quite in accordance with our knowledge of the subsection *Villosæ* at that time, *R. omissa* not having been recognized as distinct. Mr. Ley, in Journ. Bot. 1907, p. 206, raised it to specific rank, which is more than it deserves, but he reduces it again in Lond. Cat. ed. 10 to a variety of *R. Andrzeiovii* Stev., which is a member of the *pomifera* group, incorrectly assumed to be a British plant. The proper place for var. *pseudo-mollis* is certainly in the group *R. Sherardi*, but, in accordance with my rule, I am not proposing a fourth combination for its name, which may quite probably have to be changed again before long.

Mr. E. G. Baker, who first gathered var. *pseudo-mollis* on the Malvern Hills, says (*l. c.*) that it differs from *R. tomentosa* in having the suberect habit and intensely pubescent leaves of *R. mollis*, and sepals more persistent than those of *R. tomentosa*, though less so than in *mollis*; its fruit also is smaller, and ripens later than in that species, though he thought that dried specimens in an early stage would be quite indistinguishable from it. This opinion conclusively confirms its group. Mr. Ley credits it with having no subfoliar glands except on the midrib, but there is no doubt about their presence elsewhere on the lower surface, both on Mr. Baker's type-specimen and on specimens in Mr. Ley's herbarium from the original bushes.

Specimens from these bushes have numerous, rather stout, straight or curved, sometimes quite falcate, but not hooked prickles. Stipules densely pubescent, usually glandular, wider upwards, but with acute auricles. Petioles densely but shortly

pubescent, moderately glandular, somewhat prickly. Leaflets rather small and somewhat close set, oval or broadly oval, subcuspidate, very finely, softly greyish hairy above, very densely so beneath, many of the leaflets furnished with fairly conspicuous scattered glands, though some are eglandular, the secondary nerves very prominent, toothing rather fine. Peduncles solitary or in threes, glandular-hispid, about equalling or a little longer than the rather small, smooth, or somewhat hispid, subglobose, or sometimes larger and more ovoid fruit. Sepals about equalling or somewhat longer than fruit, very glandular-hispid, moderately pinnate, spreading erect, deciduous just before fruit ripens. Styles villous.

A specimen by T. B. Blow from Chapel Foot, Herts, is placed here by Mr. E. G. Baker. It scarcely differs except in its more ovoid fruit, always in clusters of two to three, but it varies from obovoid to suburceolate. Its collector labelled it *R. mollis*, doubtless from its habit and general appearance.

This variety comes very near the three preceding and the following species. From *R. Sherardi* it differs in its less falcate prickles, its more or less glandular leaflets, and normally its more ovoid fruit. From *R. omissa* it differs in its more falcate prickles, rather longer peduncles, and more often ovoid, somewhat glandular-hispid fruit. From var. *submollis* its more falcate prickles and its subfoliar glands should discriminate it, while from *R. resinosoides* it can be distinguished by its more falcate prickles and less glandular leaflets; but all these distinctions are weak and comparative ones only, and the supposed characteristics of each are by no means so well-defined as their written descriptions give us to understand. For example, *R. omissa* is by no means confined by Déséglise to plants with straight prickles and short peduncles, nor has *Sherardi* by any means quite spherical fruit. It is not clear whether Mr. Ley intends his var. *submollis* to have quite straight prickles or somewhat curved ones, and so for all the characters of this quartet.

Rosa resinosoides

Crépin, ex Cottet, Guide du Bot. du Cant. Frib. p. 168 (1891).

"A tufted bush. Stems stiff, branches glaucous violet. Prickles unequal, straight or inclined, dilated at base, whitish on old stem, more slender, setaceous, and reddish on young shoots. Petioles villous, very glandular, with numerous unequal, whitish, recurved prickles. Leaflets 5–7, subsessile, the lowest *obovate*, subtruncate at apex, the upper *oval or oblong-oval*, *rounded* or acute, close, overlapping, greenish, softly villous, pubescent above, greyish tomentose with numerous reddish scented glands beneath, especially the lower, biserrate, toothing open, ending in a gland. Stipules broad, glabrous above, pubescent and glandular beneath. *Auricles diverging*, *short*, obtuse in the lower, cuspidate in the upper. Peduncles *very short*, solitary, or in a small corymb, the central one almost *sessile*, hispid glandular, with broad, oval, acuminate

bracts, glabrous above, pubescent and abundantly glandular beneath, covering and longer than the peduncles. Calyx-tube *ovoid*, hispid with slender, soft, not spiny glandular setæ. Sepals short, oval-lanceolate, charged with stipitate glands on back and edges, appendiculate and gland-ciliate at apex, three entire, two pinnate with 2–3 short lobes, gland-ciliate, salient in bud, shorter than corolla, spreading in flower, then erect, connivent. Flowers small, bright rose. Styles villous, disc little salient. Fruit *ovoid roundish*, subpyriform in the middle of the corymb, usually hispid, crowned by persistent sepals."

As in many of the foreign species, the name *R. resinosoides* was in use long before the description was published. It first appeared in Cottet's list of Roses of Valais in Bull. Soc. Murith. p. 44 (1874). Then in 1876 Déséglise, in Cat. Raison. p. 326, placed it as a synonym of the plant he had described in Ess. Monog. (1861) as *R. resinosa* Sternb., but which he found later was not Sternberg's species. This description is practically the same as Crépin's, given above. Crépin, in Bull. Soc. Roy. Bot. Belg. xxi. p. 48 (1882), writes of *R. resinosoides* :—"This name has been given by me to forms which have been confused with the name of *R. resinosa*. M. Déséglise admits this name [*R. resinosoides*] into his Catalogue, No. 395, but has continued to associate glandular variations of *R. mollis* with this variety of *R. tomentosa*." Lastly, in *op. cit.* xxxi. p. 169 (1892), Crépin says:—"In the form of *R. omissa*, which I have called *R. resinosoides*, the peduncles are less short, but its other characters are those of *omissa*."

If we are to be guided by Crépin's latest published note, quoted above, namely, that his *R. resinosoides* is only a longer peduncled form of *R. omissa*, the inference is that Déséglise's specimens do not represent Crépin's species, because the average length of the peduncles in the herbarium of the former is not greater than in *omissa*; while the two *exsiccatæ* he quotes, *viz.* his own No. 75, and Billot, No. 360, have them decidedly shorter. I have seen no specimen named by Crépin, who, in his later days, altered his views considerably as regards his earlier publications, not only about his own species, but about those of others. Still it is not really clear that he meant to throw over his original description published by Cottet. Keller, however, remarks that *R. resinosoides* is only an insignificant variety of the type (*omissa*), and as he does not as a rule hesitate to base varieties upon very unstable characters, he cannot have seen much in Crépin's species. His notes are obviously condensed from Crépin's own description, but he alters the description of the peduncles to agree with Crépin's latest note, thus: "*Peduncles mostly rather long*, in many-flowered clusters, the middle flowers almost sessile." He also emphasizes "*Prickles unequal*." Rouy and Déséglise call attention to the roundish fruit as compared with the obovoid ones of *R. omissa*, and if Déséglise's specimens are to be trusted, they bear this out in having subglobose or even suburceolate fruit, but sometimes they are obovoid. Rouy distinguishes *R. resinosoides* further by its more slender, straighter prickles; but none of these differences

appear constant, and the species is a most unsatisfactory one. I regard it for the present as a long-peduncled *omissa*, but think it has a tendency to a more ovoid and often aciculate fruit, which brings it very near var. *pseudo-mollis*. Déséglise's No. 75, which he quotes in Cat. Raison. p. 326, as a typical *exsiccata*, is indistinguishable from *pseudo-mollis*, even in prickle characters and fewness of subfoliar glands.

There are three British specimens in Déséglise's herbarium. Mr. Baker's No. 18, from hedges between Thirsk and Woodend, labelled *R. tomentosa* auct. angl., has very few, but stout, slightly curved prickles; leaflets oval, rounded at apex, subglabrous above, rather thinly and finely pubescent beneath, and rather densely finely glandular, sometimes not more than microglandular; petioles densely pubescent, a good deal glandular, and with few small prickles; stipules narrow, with narrow lanceolate auricles, much gland-ciliate but not very strongly glandular on the back; peduncles 1 to 3, about equalling the fruit, considerably glandular-hispid; fruit broadly ovoid, very little glandular-hispid; sepals as long as fruit, spreading erect, very densely glandular on the back, not much pinnate. Styles cannot be seen. His No. 16, from the same station, labelled *R. villosa*, has similar but more numerous prickles; leaflets rather large, elliptical, acute or somewhat acuminate; petioles and stipules as before, but peduncles longer, and fruit rather more aciculate, sepals much longer and more connivent, fruit varying from ovoid to globose on the same specimen. Styles villous. No. 19, from Hornby, N. Yorks, has much more numerous, more slender, but still curved prickles; leaflets elliptical acute, and rather more hairy, the subfoliar glands more conspicuous; petioles much more prickly and glandular, but with remarkably little hair for the group; peduncles longer than in No. 18; fruit very similar; styles villous.

Rosa tomentosa var. uncinata

F. A. Lees in Report Bot. Record Club for 1884–6, p. 123 (1887).

"The fruits were mostly ripe when the specimens were gathered, and all the sepals have fallen except on one scarlet, half-ripe, ovate urceolate fruit on which they persist semi-erect. In all other cases, after reflexing, they have fallen before the hairy fruit, gland-setose as well as peduncles, had become deep red. The prickles on both young shoots and old stems have broad bases, and very uncinate (quite as in *rubiginosa*) and equal in size. The leaflets are oblong oval, *scabriuscula*- or *mollissima*-like in general shape, hairy above, below (very) and on pedicels [*sic*], also glandulous beneath and on the petioles. The stipules are moderate in size, and in other respects like our ordinary *tomentosa*. The flowers appear to be produced in twos and threes, but the plant will have to be gathered again to be certain of their colour."

As part of the above, though I have not thought it desirable to include it in the description itself, Dr. Lees writes (*l. c.*):—"A

very striking plant, well worthy of some such name as I have proposed above, so essentially (and not merely superficially) intermediate between the *Tomentosæ* and the *tomentella-decipens* set of *Caninæ* is it, that if characters have any limiting value, it is very difficult on account of their crossing to certainly refer it to the one rather than the other. I, however, consider it decidedly a *tomentosa* var. . . . In very similar plants in the Sheffield neighbourhood by Amos Carr, some years ago, the petals were pale pink; all these save one (which having nude fruit was passed as *Borreri*) were referred, after much study, to *tomentosa*, and in my recently published Flora of W. Yorks (p. 230) I refer specially to the misunderstanding which has arisen from 'certain forms of *R. tomentosa* with hooked prickles' being allocated to *R. canina* because of the uncination."

The following notes have been drawn from specimens kindly lent me by Mr. Bailey, who first discovered var. *uncinata*. Branching compact, internodes somewhat flexuose. Prickles decidedly stout for the group, the stoutest quite like those of *R. lutetiana* Lém., but variable in strength and size, all, except sometimes those near the inflorescence, at least falcate, and often quite uncinate, being curved into a quadrant, so that the tip points down the stem or branch. Leaflets 7, of medium size, rather close set, oval, subacute or obtuse, those on barren shoots larger and broader in proportion, thinly and finely pubescent above, somewhat more densely so, but not soft beneath, usually glandular at least on secondary nerves, and often on whole lower surface; primary teeth rather deep, acute and directed forward, with many irregular denticles, petioles very glandular with a good many hooked pricklets, those on barren shoots less glandular and less prickly. Stipules rather broad, very glandular, with rather short auricles. Peduncles mostly solitary, sometimes in threes, glandular-hispid, equalling or shorter than, rarely longer than, fruit, which is large, quite ovoid, or somewhat urceolate, sometimes almost ellipsoid, smooth, or slightly glandular-hispid. Sepals very glandular, dark coloured, much pinnate, spreading-erect, not falling till fruit is ripe at end of September or beginning of October. Styles rather thinly hispid.

Mr. Bailey describes the colour of the flowers as a full pink, rather lighter in colour than in *tomentosa*. Dr. Lees's description of the sepals does not agree with any of Mr. Bailey's specimens, and I do not know what specimens he had before him when he wrote it.

Archer Briggs thought var. *uncinata* to have prickles very unlike those of *tomentosa*, which it seemed to connect with *R. Borreri* and *R. Bakeri*. Crépin at first thought it to be a form of the same group as his *pseudo-cuspidata*, but that its hooked prickles brought it very near the *coriifolia* group.

As above defined, var. *uncinata* appears to be a fairly well-marked variety, nearest var. *pseudo-mollis* and *R. resinosoides*, but differing from both in its stout uncinate prickles. Mr. Ley, however, associates with it many forms which have little in common

but more or less uncinate prickles, while some of them have much more densely, softly tomentose leaflets, sometimes without subfoliar glands, also with villous styles, also the less important features of flowers in considerable clusters, subglobose fruit, narrower leaflets, subentire and more connivent sepals. I think some of these fit better to *R. Sherardi* or var. *pseudo-mollis*, while others differ from *R. omissa* or var. *submollis* only in their more hooked prickles. Specimens from Brecon and Hereford, however, agree very closely with var. *uncinata*, and I think it will prove to be fairly frequent.

Rosa tomentosa var. Woodsiana

H. & J. Groves in Report Bot. Exch. Club for 1880, p. 31 (1881).

"Bush erect, compact. Prickles slender, uniform, decidedly curved, those of the main stem 4–4½ lines long, scar about 4 lines long. Leaves 2½–3 in. long, and 2–2½ in. broad; petioles hairy and densely glandular; leaflets elliptic, the terminal 12-15 lines long and 6–9 broad, thinly hairy above, and hairy and slightly glandular beneath, serratures copiously compound. Flowers 1–3. Peduncles and calyx-tube glandular. Sepals persistent, becoming erect. Corolla small, pale pink. Styles slightly hairy. Fruit ellipsoid.—A form nearly allied to *R. scabriuscula*, from which, however, it differs by its smaller size, more compact habit, narrower leaflets, with more compound serratures, more ellipsoid fruit, with decidedly erect persistent sepals. It differs from *R. fœtida* and *R. sylvestris* by its narrower much less glandular leaflets and hairy styles."

The following notes are drawn up from specimens in Mr. Bailey's herbarium and at South Kensington, gathered by Nicholson, its finder, on Wimbledon Common, the original station, in which Mr. Pugsley tells me it is now extinct. Internodes flexuous, branching compact. Prickles not numerous, few on some parts, usually rather small, but moderately stout or rather slender, falcate or slightly so, but none of them uncinate. Leaflets 5–7, dark green, quite elliptical or even narrowly so, decidedly narrowed at base, subglabrous above, thinly hairy on principal veins, rarely also on surface beneath, irregularly glandular, mostly quite eglandular though scabrous on midrib and secondary veins, but some with rather conspicuous scattered glands, primary teeth moderately deep and acute, well directed forward, with many denticles. Petioles finely but rather densely pubescent, often considerably glandular with a few small, slender, straightish pricklets. Stipules rather narrow, not much glandular on the back, but very strongly gland-ciliate. Auricles long, very acuminate. Peduncles solitary, or in clusters of 3–4, glandular-hispid, moderately long. Fruit rather small, ovoid or subellipsoid, mostly with rather narrow base but hardly obovoid, smooth, or moderately glandular-hispid. Sepals long, suberect, dark, very glandular, considerably pinnate with long pinnæ, all persisting till at least September, when the fruit begins to ripen. I have not seen them later. Styles hispid, sometimes rather thinly so but never woolly.

I cannot see the propriety of uniting this as a variety to *R. uncinata*, as Mr. Ley does in Lond. Cat. 10, even if specific rank be conceded to the latter at all. The prickles of var. *Woodsiana* are not uncinate, but only falcate, and that not strongly. In general appearance it is much nearer *R. sylvestris*, but its persistent sepals remove it from the *tomentosa* group. It seems to me far better to make it a variety of *R. suberecta* Ley, which it resembles in its elliptical leaflets and dark, much pinnate, spreading-erect sepals, but it lacks the long straightish prickles on stem, and the strongly armed petioles of that species. Déséglise has placed a specimen in his cover of *R. fœtida* Bast., but I can hardly believe he meant it to remain there. He did not write the name on it, as he usually did, while its persistent sepals and hispid styles absolutely exclude it from that species.

So far as I am aware it has never been gathered anywhere except on Wimbledon Common, where I believe only a single bush existed, and that is now extinct. I have, however, just seen a specimen collected at Foxhall, N. Hants, by Mr. Druce in 1878, which differs only in its woolly styles.

Rosa suberecta

Ley in Journ. Bot. 1907, p. 206.

"Thorns straight, sometimes robust, more or less falcate; leaflets oval-elliptic, more or less hairy on both sides; subfoliar glands few or many; petioles very glandular, *with many unequal, falcate acicles and pricklets*; clusters of 1–5 flowers; peduncles moderate, these and the ovoid calyx-tube densely and longly glandular aciculate; fruit globose; sepals considerably pinnate, appendiculate, densely glandular aciculate, suberect and subpersistent. Petals rose, sometimes 'white with purplish spot' (Marshall). Young stems, petioles, thorns, stipules, and bracts *vinous red*."

The following notes are taken from about thirty specimens in Mr. Bailey's herbarium, which have been named by Mr. Ley without any expression of doubt. Growth usually very strong and stout, rather dense. Bark often smooth, reddish or brown, as in *mollis*. Internodes nearly or quite straight. Prickles numerous, somewhat unequal, stout, or rather stout, long, straightish, or more often slightly curved, occasionally even falcate on old shoots, those on the barren shoots often very long and stout, and on account of their long bases much curved on their lower edges. Leaflets 7, large or rather large, contiguous, elliptical-oval or oval, acute or subacute at apex, rounded or somewhat narrowed at base, dark green, not greyish as in *R. Sherardi* and its allies, thinly, finely pubescent above, more densely tomentose though not very soft beneath, usually with many small green glands, primary teeth rather coarse, deep and acute, well furnished with denticles. Petioles rather densely pubescent, almost always furnished, especially towards the base, with very many dark red glands, glandular acicles and pricklets of all sizes,

by which feature alone it can very often be identified. Stipules broad, very often subglabrous, varying from smooth to densely glandular, often reddish, especially towards the petioles, auricles very variable, but usually rather long and acuminate. Peduncles moderate to rather long, strongly and often densely glandular-hispid or setose. Sepals long and broad, spreading erect, persistent, not connivent, with many broad pinnæ, much glandular on the back. Fruit mostly glandular-hispid or sometimes setose, rather rarely quite smooth, when young ovoid or even ellipsoid, more rarely broadly ovoid, never globose. All the specimens I have seen were collected in late July and early August, so I cannot confirm Mr. Ley's statement that the fruit is globose, but it hardly looks as if it would become so. Styles densely hispid or villous.

In its typical form, a very well-marked species, known by its long stoutish prickles, its tendency to reddish colouring all over, its somewhat elliptical leaflets, very densely armed petioles, densely setose peduncles in clusters and long spreading dark sepals with conspicuous pinnæ. Mr. Ley considers his species to be identical with Woods's No. 30 *R. villosa* ♪ *suberecta* from Ingleton, near Ingleborough, Yorks. I rather doubt the identity, but admit some similarity. Woods's specimen differs in its perfectly straight long slender prickles, small very close-set leaflets, perfectly globose calyx-tube and entire sepals. All these characters point to a close affinity with *R. pseudo-rubiginosa* Lej. It resembles *R. suberecta*, however, in its densely armed petioles and its red colouring.

Most of the specimens in Mr. Bailey's herbarium, which are now named *R. suberecta* by Mr. Ley, had been labelled *R. mollis* by Mr. Baker and other botanists. Five had been labelled *R. scabriuscula*, four *R. tomentosa*, and one *R. subglobosa*. Of those labelled *R. mollis*, one is a *canina* form, and one looks like *R. Doniana*, but neither of them have flowers or fruit. The best forms of *R. suberecta* come from W. Sutherland, Easterness, S. Elgin, E. Ross, S. Northumberland, N.E. Yorks, and Londonderry, but Mr. Ley records it as far south as Carnarvon and Derby.

Rosa suberecta var. glabrata
Ley in Journ. Bot. 1907, p. 206.

"Leaves glabrous on both surfaces; subfoliar glands few; petioles, sepals, and fruit as in type."

This seems to be simply glabrous-leaved *suberecta*, but the only specimens I have seen have more widely spaced, narrower, decidedly more acuminate leaflets, with deeper serration than in the type; in fact, much more *tomentosa*-like except for absence of hair. The fruit also is more broadly ovoid, so as to more nearly approach to Mr. Ley's description of "subglobose."

According to Crépin (see Journ. Bot. 1895, p. 344), our plant was wrongly assigned by Schultz to *R. mollissima* var. *glabrata* Fries, apparently because he considers it to be a *tomentosa* form. There has, however, been so much confusion in the past over the

groups of *mollis*, *omissa*, and *tomentosa* that it is impossible to say, without seeing a specimen, whether Fries's variety really belonged to *mollis* or not. It must be recollected that *R. mollis* is a British species founded on British material, and, in spite of our many mistakes, it is more probable that the British opinion that *R. suberecta* is near *mollis* is correct, than that of Crépin that it should be referred to *tomentosa*. Of course British authors had not until quite recently recognized the *Sherardi* group at all, and even now it is not clear that we are correct in assigning to it all species with sepals persistent till fruit ripens. Continental botanists certainly include some species with such sepals in the *tomentosa* group, which accounts for Crépin's opinion as to var. *glabrata*.

I have seen specimens from E. Ross and W. Inverness only.

Rosa cinerascens

Dumortier, Florula Belgica, p. 93 (1827).

"Prickles straightish. Leaflets simply dentate, ovate acute, petioles eglandular and villous cinereous all round. Flowers very few. Globose urceole and peduncles hispid glandular, sepals diverging in fruit."

In his Monog. des Roses, Fl. Belg. p. 50 (1867), he says :— "Prickles straight. Petioles tomentose, eglandular. Leaves ashy tomentose, villous below, simply dentate, urceole subglobose. Sepals of fruit persistent erect.—A bush of 4 to 5 feet, with branches covered with a glaucescent powder. Prickles almost straight, dilated at base and compressed, slender, scattered. Leaves with tomentose petioles, without glands, and often without prickles. Leaflets oval acute, simply dentate, tomentose above, velvety and greyish beneath, with salient nerves. Flowers rose, solitary or few, with peduncles bearing glandular setæ, and also the urceole. Sepals spreading, persistent till the fruit ripens. Fruit red, globular, sometimes ovoid, with aciculate setæ, sometimes glabrous."

Although Dumortier makes a large aggregate of *R. tomentosa*, including several species of the *Sherardi* group, he keeps *R. cinerascens* distinct, not only on account of its uniserrate leaflets, but also from its eglandular petioles and its persistent sepals. There is a scrap collected by him in Déséglise's herbarium. It is too small and young to be of service, but it has *quite biserrate* leaflets, almost all the teeth of those on the flowering-branches having two to four denticles, though there are some simple teeth on the leaflets of the barren shoot, but even here not the majority. This is a good example of the misleading character often shown by authors' specimens, though of course some mistake in label is possible.

The species appears to have been misunderstood by Déséglise and Crépin. The former, in his Rev. Tomentosæ, p. 31, quotes Dumortier's original description "*sepalis fructu divergentibus*," but ignores his later one, quoted above, from the Monograph. Moreover, Déséglise's own description says "*sepales ... non persistantes*,"

and specimens in his herbarium agree. They should, I think, be referred to *R. dumosa* Pug., one of the uniserrate forms of the *tomentosa* group, but said by Déséglise to differ from *cinerascens* only in its glandular prickly petioles, its larger leaflets, ovoid fruit, and villous styles. In these respects most of Déséglise's specimens are nearer *R. cinerascens*, but the persistence of the sepals is more important than any of these minor points. Crépin makes the same mistake, distinguishing *R. dumosa* and *R. cinerascens* by much the same characters as Déséglise does, and not by the relative persistence of the sepals. Keller follows suit, but Rouy makes the correct distinction.

Although in consequence of Déséglise's mistake his herbarium is useless for the diagnosis of *R. cinerascens*, and also the only author's specimen I have seen can hardly belong here on account of its biserrate leaflets, we should be quite safe in referring to Dumortier's species plants with uniserrate leaflets and sepals persistent till the fruit ripens. Other features are eglandular and unarmed petioles, globose or sometimes ovoid fruit, and hispid not woolly styles.

I have seen several British specimens which may be referred here, but they are not very conclusive. Mr. Barclay's No. 37 from the Earn below Cowrie, Perth, has been named by Crépin, Sudre, and Dingler. It agrees in most particulars, but has slightly prickly petioles, and the sepals are partly fallen by Sept. 7th. Its styles are woolly. His No. 157, from Orchardneuk, Perth, passed by the same authorities, has quite glandular petioles, spreading-erect sepals (on Aug. 6th), and apparently hispid, not woolly, styles. It is rather early to predict when the sepals will fall, but they appear strongly attached. His No. 52 (and No. 147) from Auchterarder has also been named by Crépin, but has not been seen by Sudre or Dingler. It has glandular and prickly petioles, spreading-erect sepals on July 30th, with a much more ovoid or obovoid fruit than the others. Its styles are hispid. Mr. Ley places here specimens from Dove Dale, Derby, which agree better with Dumortier's description than any, and I think the specimens from Alstonfield, Stafford, are correctly named. I venture to doubt those from Durham and Radnor. I have seen no other British examples.

Rosa farinosa

Bechstein, Förstbotan. ed. 1, p. 243 (1810).

"With roundish ovoid smooth fruit and peduncles. Leaflets roundish oval acute, sharply toothed, shortly hairy and finely rugose above, softly and densely hairy beneath, with grey-green, almost straight prickly stem."

The above is actually copied from the fifth edition (1843), no copy of the first being obtainable, but Rau (Enum. p. 147, 1816) gives the same description *verbatim*, quoting from the first edition, so I have no doubt it is correct.

Bechstein, in ed. 5, continues:—"At first sight this bush has

great affinity with the preceding [*R. hispida*], but is essentially distinct. It is 4–5 feet high, and forms a short densely-branched bush. It is so thickly scattered with meal that I have given it its name. It is found in limestone hedges and thickets in Frankonia. The stem is red-brown, but the young twigs are shining pale green, with solitary, slender, short, almost straight, but slightly declining prickles. The leaves have quite white, densely hairy, almost silky petioles, with some red prickles on the under side, channeled beneath (*unten*) with sharply-pointed stipules, densely hairy on edges, and with some red glands on the back. Leaflets 7, oval, bluntly pointed, with sharp well-defined teeth, ciliate with hairs, covered with slender hairs above, finely wrinkled with veinlets, dull dark green, appearing as if strewn with very fine powder, which, when rubbed off or washed off by rain, leaves a peculiar lustrous brightness,. with raised veins beneath, grey-green with dense white almost silky hairs, like velvet. The lowest pair are exceptionally small, the terminal conspicuously large, the lateral pairs all sessile. The flowers are single or in pairs on short densely set side branches, on shining smooth peduncles, with a stipule bearing three leaflets at the base of each, also an oval, sharply acute, greenish yellow, densely white, hairy bract. The calyx-tube is roundish ovoid, shining, smooth, dark green, of the five sepals two are strongly pinnate on both sides, one on one side only, and two impinnate, all softly hairy inside, outside, and on edges. Petals are of medium to large size, very pale rose-red, with white claws, some almost white, somewhat emarginate. The roundish ovoid fruit becomes large, inflated, shining, dark red, black on the approach of winter."

Rau (*l. c.*), after quoting Bechstein's first diagnosis, gives some notes which do not differ essentially from those of Bechstein; but he says of the leaflets, "whitish villous on both sides, very soft, silky shining above, glandular on midrib and nerves beneath, biserrate." He also says the peduncles are glabrous above and pubescent at base, the sepals are eglandular on the back, and petals $\frac{1}{2}$ to $\frac{3}{4}$ inch long.

Descriptions by other authors, as in most species, vary a good deal, but all seem to agree in attributing dense shining silky pubescence to the upper surface of the leaflets, although Bechstein himself called them "dull dark green." Some mention subfoliar glands, Christ crediting it with many, though its author does not mention them at all. Rèdouté, in Roses, iii. t. 147, shows very whitish leaflets, and in ii. p. 41 remarks that they appear whitish from a distance, which led Bechstein to give it its name. The mealiness mentioned by Bechstein I therefore imagine is due to this silky pubescence and not to glands or pruinosity. It would not of course be washed off by rain, though if wetted would shine like silver, but it is difficult to understand exactly what he meant, as he speaks of the lustre after the mealiness is rubbed off.

This species is included in our list on the strength of a specimen gathered by Hailstone near Blair Atholl (Baker, No. 48), so named by Déséglise, though Mr. Baker had labelled it *R. mollis*

var. *cærulea*. It is rather small and scrappy. Its prickles are moderately stout, curved or straightish, from very dilated bases. Leaflets small and close set, oval or elliptical, subobtuse, shallowly biserrate, the denticles sometimes reduced to sessile glands, densely but softly hairy above though rather dark-looking, more so beneath and apparently very finely glandular, but this is difficult to see on account of the density of the tomentum. Petioles densely finely tomentose, scarcely glandular, and not much prickly. Stipules densely hairy both sides, finely glandular on back, with acuminate auricles. Peduncles solitary or two together, quite short, not longer than fruit, apparently quite smooth and glabrous. Fruit small, subglobose or ovoid subpyriform. Sepals entire or nearly so, spreading-erect, glandular-hispid, not much longer than fruit. Styles densely villous.

Déséglise at first confounded this species with *R. farinulenta* Crép., but afterwards rectified his mistake, but besides Hailstone's specimen, has only one sheet definitely named, *viz.* a specimen from Kerner, labelled *R. tristis* Kern., a name that was only used by Kerner in his herbarium, and which he afterwards said was synonymous with *R. farinosa* Rau. The specimen, however, looks very different from Hailstone's, differing mainly in its much lighter green, thinly hairy leaflets, rather densely and conspicuously glandular beneath, and rough to the touch on both sides. Fruit rather large, ovoid, or the central pyriform. Sepals long, narrow, and eglandular on the back, somewhat pinnate, and spreading on the well-formed fruit, fallen from the ripe fruit. It does not in the least resemble the descriptions in respect to colour and clothing of leaflets, and it is quite possible that Keller takes the correct view in referring Kerner's species to a form of *R. coriifolia* and not to *R. farinosa*.

Foreign Species of the Group R. Sherardi.

Owing to the divergences of opinion as to the limits of the groups, as well as to those of the species, it is difficult to select any foreign species which seem more likely than others to be found in Britain, but the following deserve mention.

R. intromissa Crép. This has rather stout declining or curved prickles, leaflets only slightly biserrate, densely tomentose, not subfoliar-glandular. The petioles also are almost eglandular and unarmed. Fruit subglobose or suburceolate, hispid. Sepals very glandular, erect and persistent till fruit ripens. Styles woolly. It will be seen that this comes near *R. cinerascens* Dum., though its somewhat biserrate leaflets and woolly styles bring it near *R. dumosa*, which, however, has deciduous sepals. Crépin felt convinced that, in spite of its erect persistent sepals, this was a *tomentosa* form, but it falls more naturally into the present group.

R. annesiensis Déségl. has its habit marked by its very short flowering-branches. Its prickles are straightish, leaflets eglandular, peduncles solitary, short, quite hidden by their bracts, flowers pale rose, fruit hispid, large, elongate-ellipsoid, and hispid

not villous styles. Its sepals are erect, connivent, and persistent till the fruit ripens.

R. collivaga Cottet also has straight prickles and eglandular leaflets, but its peduncles are in considerable clusters, petals fine rose with white claws, hispid obovoid fruit crowned by persistent sepals, and hispid not villous styles.

R. tunoniensis Déségl. is a low-growing dense bush with long straight prickles and leaflets glandular on secondary nerves, short peduncles, rather large obovoid or pyriform fruit, and erect connivent sepals, falling just before fruit ripens. Styles villous. Keller makes this simply a somewhat glandular form of *R. collivaga*, but it has other differences, notably its earlier falling sepals. It is rather like *R. submollis* Ley, but with shorter peduncles, which are more often solitary, and glandular leaflets.

R. tomentosa var. *globulosa* Rouy. According to M. Sudre, this is the name we must give to plants we have been labelling *R. Andrzeiovii* Stev.; in fact, Rouy himself says his variety is synonymous with Déséglise's idea of Stevens's species. Unfortunately Rouy does not give satisfactory descriptions, and it is questionable whether names mentioned only in an analytical key can stand. It is certainly most unsafe to rely upon such keys for their identification. Rouy places it near *R. subglobosa* Sm., distinguishing it therefrom by its sepals being erect and persistent, at least till the fruit colours, erroneously supposing that those of *subglobosa* (i. e. *R. Sherardi* Davies) fall earlier, consequently the two, not appearing under the same bracket, are not contrasted. I can only say that the key gives it quite eglandular leaflets, globose hispid fruit, hispid peduncles, rather stout prickles, and sepals persistent at least till fruit colours. Mr. Ley's description of *R. Andrzeiovii* in Journ. Bot. 1907, p. 207, corresponds very closely in an abbreviated form to that of Déséglise (Ess. Monog. p. 124), except that he wrongly attributes subfoliar glands to it. The leaflets are eglandular, as Déséglise's description and specimens show. Until I can say exactly how Rouy's variety differs from *R. Sherardi* Sm. I hesitate to adopt his name. Many forms named var. *globulosa* have the very long peduncles and reflexed sepals of the *tomentosa* group.

GROUP OF ROSA TOMENTOSA.

This group includes all those species of the subsection *Villosæ*, in which the sepals fall before or very soon after the coloration of the fruit. The habit also is much laxer, with more arching stems than in the *Sherardi* group, the internodes also are flexuose, not straight. Continental botanists appear to regard the habit as more important than the early disarticulation of the sepals. Quite probably this is the correct view to take in discriminating between the two groups, but as the habit is not easily determinable in a herbarium specimen, and even when growing is likely to be obscured unless the bush grows quite freely in the open, it is easier, for a systematic arrangement, to take the sepal characters

as a guide. The members of this group often have more hooked and more robust prickles than those of the last, their leaflets are wider spaced and more acuminate, peduncles long, sometimes very long, sepals comparatively flat on the back, much pinnate, reflexed, or sometimes spreading after flowering, usually fallen by the time the fruit colours, styles hispid or glabrous, not woolly, and flowers of a paler pink. Further notes have been made in the introduction to the group of *R. Sherardi* (see p. 67).

Key to British Species.

1 { Peduncles and backs of sepals smooth. Styles villous. Prickles small, much uncinate ..... *R. tomentosa* var. *obovata* Baker.
1 { Peduncles and backs of sepals glandular-hispid. Styles usually hispid or glaucous, rarely villous. Prickles larger, straight, or falcate, very rarely uncinate 2

2 { Leaflets usually densely tomentose. Styles considerably hispid, or more rarely villous 3
2 { Leaflets usually rather thinly tomentose or subglabrous, rarely densely tomentose. Styles thinly hispid or glabrous 5

3 { Leaflets not or only finely glandular beneath ..... *R. tomentosa* Sm.
3 { Leaflets decidedly glandular beneath, sometimes only on secondary nerves 4

4 { Fruit subglobose. Prickles straightish. Leaflets moderately glandular. Styles woolly ..... *R. cuspidatoides* Crép.
4 { Fruit ovoid. Prickles falcate, stout. Leaflets conspicuously glandular. Styles hispid ..... *R. pseudo-cuspidata* Crép.

5 { Styles thinly hispid, rarely quite glabrous. Leaflets usually long, narrow, and well spaced, subglabrous 6
5 { Styles usually glabrous, rarely thinly hispid. Leaflets broader, closer, and more hairy 7

6 { Subfoliar glands few, rarely none. Prickles straightish or subfalcate *R. scabriuscula* Sm.
6 { Subfoliar glands many. Prickles quite falcate or subuncinate *R. tomentosa* var. *sylvestris* Woods.

7 { Prickles moderate. Leaflets oval, of moderate size, glands usually conspicuous..... *R. fœtida* Bast.
7 { Prickles large and stout. Leaflets large, suborbicular, glands inconspicuous..... *R. Jundzilliana* Baker.

Rosa tomentosa

Smith, Fl. Brit. ii. p. 539 (1800).

"Rose with ovate fruit and peduncles hispid, cauline prickles hooked; leaflets ovate, tomentose both sides.—Smaller in all its parts than the preceding [*R. villosa*], and agreeing with *R. canina* in habit, except that the leaves are pubescent on both sides, and appear subcinereous. Branches erect patent, subflexuous. Cauline prickles hooked, dilated at base. Leaflets 5 or 7, sweet-smelling, elliptical-ovate, very softly tomentose both sides, the serratures glandular-ciliate. Petioles tomentose, muricate. Peduncles terminal subsolitary, muricate with glands and glandular setæ, even the germen muricate, elliptic. Calyx glandular-hispid. Petals white at base, of a beautiful rose towards apex. Fruit ovate, scarlet, muricate, about the size and shape of *R. canina*."

The above description is amplified and modified in Eng. Fl. p. 384 (1824), thus:—"Stem 6 feet high or more, branching, bushy, with round, brownish, prickly, but otherwise smooth and naked branches. Prickles often two near together under the insertion of each leaf, besides a few scattered solitary ones, all slender and awl-shaped, in some degree curved, but with no very great dilatation at the base, nor are they compressed and sickle-shaped like the species of the next section [*R. Sherardi*, *R. rubiginosa*, *R. canina*, &c.]. Leaflets 5 or 7, ovate or slightly elliptical, mostly acute at the extremity and somewhat pointed, their serration double, acute, and glandular, both surfaces usually hoary soft, and downy, with a slight resinous scent, the under one more or less glandular. Footstalks downy, sometimes beset with many hooked prickles, as well as copious glandular bristles. Stipules linear, downy, with a densely glandular point, the uppermost becoming broad, ovate, pointed bracteæ. Flower-stalks usually 2 or 3 together, often solitary, seldom 4, longer or shorter than the bracts, clothed plentifully with glandular bristles of various lengths. Tube of the calyx elliptical oblong, sometimes almost globular, generally covered irregularly with glandular bristles, which are more crowded about the base, but occasionally it is quite smooth. Two segments of the very bristly limb and one side of a third copiously pinnate, with as long leafy acute toothed and glandular leafits as in any species whatever. Petals light red, white in their lower half, sometimes white blotched with red. Fruit scarlet, generally bristly, broadly elliptical, retaining the limb of the calyx, either spreading or reflexed till quite ripe, when the latter usually falls off."

Smith's later description differs from his first in three important particulars. The prickles, which he originally described as hooked (*aduncis*), are now only "in some degree curved," the adjective "awl-shaped" also giving the idea that they are nearly straight. The leaflets also are more or less glandular beneath, and the sepals are spreading or reflexed but persistent. The two latter characters may perhaps be regarded as additions, not alterations, but there must either have been some error of observation on Smith's part with regard to the sepals, or he had more than one species before him when he made his description. I have never seen a rose with sepals reflexed and yet persistent till the fruit is ripe, and Mr. Ley and Mr. Barclay, whose knowledge of the group in the field is much greater than my own, say no such rose exists in Britain. Sepals which are reflexed or only spreading do not persist for long after the fruit reddens; it is only those which are erect or spreading-erect which remain till it ripens. Smith may have taken a broad view of "spreading" sepals, and included those which ascend considerably above the disc, but taking his two descriptions collectively, much the more satisfactory explanation is that he used the name *R. tomentosa* in an aggregate sense, that is, as we should understand an aggregate now. In Smith's days the minor species we now recognize would not have received notice, and there is little doubt that he

included in his *R. tomentosa* several forms of the *Sherardi* group, though he appreciated the differences in typical *R. Sherardi*.

A reference to Smith's specimens corroborates the idea that his was a very comprehensive one, and cannot be restricted to a definite segregate, though Déséglise devotes nine pages of his Rev. Tomentosæ to a discussion on this point. His arguments and deductions were, however, based upon notes supplied to him by Mr. Baker on the specimens in Smith's and Woods's herbaria, and on material supplied to him by British botanists. The result, not unnaturally, was considerable confusion. Déséglise thought, from Mr. Baker's notes on one of Smith's specimens, which is undoubtedly *R. fœtida* Bast., that it was one of the *Rubiginosæ*, and consequently he excluded it and certain others from his considerations. His conclusions were that type *R. tomentosa* Sm. has eglandular leaflets, though he knew that Smith's latest description said they were glandular. He gets over this difficulty by reverting to Smith's first description, assuming that, as subfoliar glands were not mentioned, they did not exist. Déséglise, however, is not quite consistent, because he does not take up the hooked prickles of the Fl. Brit., but even goes beyond the Eng. Fl. description in making them straight and horizontal, instead of "in some degree curved."

Mr. Ley, in Journ. Bot. 1907, p. 208, restricts typical *R. tomentosa* Sm. to a plant with falcate prickles, eglandular leaflets, long peduncles, often in a cluster, and sepals always reflexed and deciduous before the fruit reddens. The eglandular leaflets and deciduous sepals are hardly authorized by Smith's first description and are distinctly barred by his second, so that Mr. Ley's definition appears to me rather arbitrary. Even if we grant that an old aggregate may be shorn of several modern segregates and still retain its identity, it seems to me that it can only do so in an aggregate sense, unless one of two conditions is fulfilled. Either there must exist a type-specimen which represents the species as originally understood by its author, or else the amended description, after the modern segregates have been removed, must only cover a species as understood by modern writers on the genus, and not an aggregate. *R. tomentosa* Sm. certainly does not fulfil the first condition, namely, the existence of a type-specimen, nor does it to my mind fulfil the second; thus the description still covers an aggregate, and not a well-defined species. We cannot turn to Continental authors for a correct interpretation of a British species, especially in view of the fact that they have learnt what they know of it from British botanists, and no two of them quite agree in their presentation of it.

I therefore regard *R. tomentosa* Sm. as an aggregate species, covering all those forms of the group which have straight or hooked prickles, softly hairy leaflets with or without subfoliar glands, long or short hispid-glandular peduncles, either solitary or in considerable clusters, and ovoid or broadly ellipsoid hispid fruit, with reflexed or spreading deciduous sepals. Its softly hairy

leaflets exclude *R. fœtida* Bast., *R. scabriuscula* Sm., and their allies, which, as a rule, also have more glabrous styles and longer peduncles, and might almost form a separate subgroup. In our British list, *R. cuspidatoides* Crép. and *R. pseudo-cuspidata* Crép. are very closely allied to and must be associated with an aggregate *R. tomentosa* as a subgroup, but there are other well-marked British forms, several of which are very close to those which have received Continental names, but which it is difficult to identify satisfactorily. There is no doubt that the whole group of *R. tomentosa* is capable of further subdivision in Britain.

Rosa pseudo-cuspidata

Crépin in Bull. Soc. Roy. Bot. Belg. xi. p. 89 (1872) (sine descript.).

Crépin gave no description in the work quoted, but suggested the name for the plant erroneously called *R. cuspidata* M. Bieb. in France. Déséglise's description of *R. cuspidata* in Rev. Tomentosæ, p. 8 (1866) refers to the French plant, and not to that of Bieberstein. It is as follows:—

"A low, branching shrub, with rather strong, whitish, scattered prickles, those of the stem dilated at the base, a little curved at the tip, those of the young branches roundish at the base, horizontal. Petioles *glandular-villous*, prickly. Leaflets 5–7, the lateral petioluled, terminal rounded at the base, more or less attenuate or acute at the apex, [the lateral] rather broad, *oval-lanceolate*, more or less obtuse, or more or less attenuate at the apex, more or less pubescent above, *whitish, softly villous, and sprinkled with glands beneath*, doubly dentate with glandular teeth. Stipules pubescent above, pubescent and glandular beneath, the upper dilated, auricles acute, diverging. Peduncles hispid, solitary, or more or less numerous, 3 to 10 in a corymb, furnished at their base with oval acuminate pubescent bracts, which also bear scattered glands on their backs, equalling or exceeding the peduncle. Calyx-tube *ovoid, hispid*. Sepals tomentose within, glandular on back, appendiculate at apex, two entire, three pinnatifid, with linear lanceolate appendages, bordered with shining, pedicellate glands, equalling the corolla, reflexed, then erect and deciduous. Styles hispid, disc flat. Flowers *rose, becoming whitish*. Fruit *ovoid*, red."

The true *R. cuspidata* M. Bieb. comes from the Caucasus. It is much more glandular, and appears to be closely related to, if not actually a member of, the *Rubiginosæ*. Crépin, who had seen an author's specimen of *R. cuspidata*, realized that the French plant was not that species, and first proposed for the latter the name of *R. cuspidatoides*, giving a description in Scheutz stud. öfr de Skand. arten of släg. Rosa, p. 37 (1872), in Scandinavian, which he republished in Bull. Soc. Roy. Bot. Belg. xi. p. 127 (1872), thus:—"Prickles of stem straight or a little falcate. Leaflets 5–7, ovate, elliptical-oblong or lanceolate, softly tomentose, rarely ashy, with scattered glands beneath, doubly serrate.

Flowers corymbose, nearly white. Bracts rather large. Receptacle ellipsoid-rotund or ovoid, erect, smooth or hispid-glandular, hard. Sepals spreading after flowering, at length deciduous." But Crépin seems to have overlooked that on p. 89 of the same work he had suggested the name *R. pseudo-cuspidata* for the plant erroneously called *R. cuspidata*, which oversight is unfortunate, as the name *R. cuspidatoides* has been applied by Crépin to a different form, as will be seen under the next species.

The name *R. pseudo-cuspidata* Crép. must therefore be applied to those examples of the *tomentosa* group which have rather stout, straightish or slightly curved prickles, somewhat elliptical leaflets, densely tomentose, and with scattered glands beneath, whitish flowers in considerable clusters, ovoid or broadly ellipsoid fruit, and hispid, or, as Keller says, subglabrous styles. I have seen no specimens named by Crépin, but most of those in Déséglise's herbarium, which are labelled *R. cuspidatoides* Crép., seem to recede even further from the description of that species, as given below, than that of *R. pseudo-cuspidata* would warrant. They have usually stout, curved or falcate prickles, rarely slender and straight, elliptical not broadly oval leaflets, always densely glandular beneath, though the glands are usually small and green, peduncles 1 to 3, about twice as long as fruit, which is quite ovoid, occasionally almost ellipsoid, never subglobose, generally hispid-glandular. Styles hispid or thinly so.

There are ten British specimens in this cover in herb. Déséglise, which vary greatly, some no doubt being referable to *R. pseudo-cuspidata* Crép., others to the true *R. cuspidatoides* Crép., and some, I think, to neither. I would place to *R. pseudo-cuspidata* specimens collected by Archer Briggs from Stretchley Down and Bickleigh Vale, S. Devon, and Landulph, Cornwall; also Mr. Baker's No. 22 from Muker, N. Yorks, No. 25 from Cleveland, N. Yorks, and more doubtfully No. 29 from Westhoe, N. Yorks. It is probably our commonest of those forms of the *tomentosa* group which would fall under Smith's aggregate.

Rosa cuspidatoides

Crépin in Bull. Soc. Roy. Bot. Belg. xxi. p. 94 (1882).

"This form, which I have separated from the *R. cuspidata* of French authors, is distinguished chiefly by its broad oval leaflets, its flowering receptacles and fruit subglobose or globose, and its fine rose flowers. It actually represents a group of varieties which might well be subdivided."

Keller, in Asch. & Graebn. Fl. Mitteleur. p. 88, credits it with large fruit, that of *R. pseudo-cuspidata* being small, and with densely hairy or woolly styles. He adds that it is especially a northern and eastern variety.

As has already been pointed out, Crépin had formerly applied the name of *R. cuspidatoides* to *R. cuspidata* auct. gall. non Bieb., but as he had already called the latter *R. pseudo-cuspidata*, and in 1882 expressly said that he distinguishes *R. cuspidatoides* from

it by the characters above quoted, it is evident that we have two species to deal with. Whether they are specifically distinct, or indeed whether either is specifically distinct from *R. tomentosa*, can only be decided after much study in the field, as at present there is certainly some doubt as to the limits of *R. tomentosa* Sm.

In Déséglise's cover of *R. cuspidatoides* there are the following British examples which seem to belong to that species rather than to *R. pseudo-cuspidata*, viz. Mr. Baker's No. 20 from Holywell Dene, No. 21 from Muker, both in N. Yorks, and No. 50 from Thornton, W. Yorks.

Rosa scabriuscula
Smith, Eng. Bot. t. 1896 (1810).

"Fruit roundish ovate, bristly as well as the flower-stalks. Prickles awl-shaped, nearly straight. Leaflets elliptical, roughish with minute hairs.—The prickles of the stem of this rose are more straight and slender than in *R. tomentosa*. The leaves are certainly very different to the touch, nor have they the same scent. There is a harshness about them, even when most hairy, in every way unlike those of *R. tomentosa*, neither have they the same greyish hoary hue. Their midrib is hairy. The flowers, according to Mr. Winch, are always white, tinged or blotched with red, and the fruit large, 'in shape rather resembling that of *R. villosa* than of *R. tomentosa*.' I did not remark anything peculiar in the colour of the flowers at Bury, nor have I seen the fruit, but I observe the germen varies in shape and in the quantity of its bristles."

In Eng. Fl. p. 384 (1824), Smith puts *scabriuscula* as a variety *β* of *R. tomentosa*, without description, but writes in his notes:—"*β* appears at first sight a very distinct species, whose leaves are greener and more harsh, nearly smooth except the ribs, which are hairy. Such at least is my Suffolk plant, first noticed in company with Sir T. Cullum and Mr. Crowe, the calyx-tube of which is remarkably slender. This I had in view in the description in Eng. Bot., though the figure was drawn from a plant of Mr. Winch, then considered to be the same. The latter has a rounder calyx-tube, and the leaflets, except their ribs, are quite smooth. Another specimen from this gentleman precisely accords with those from Bury, while Mr. Woods describes those he received from Mr. Winch as 'hoary with a velvety down and exceedingly soft both sides, perhaps more so than is usual in any other species.' So I find them, and these therefore can only belong to *R. tomentosa*. They prove how liable its pubescence is to vary."

It will be seen that the ground-work of confusion began even before *R. scabriuscula* was described, through Winch having supplied Smith with specimens of two different species, one of which was certainly a *mollis* form, which latter alone he sent to Woods, so that the latter's description refers entirely to a *mollis*

form, corresponding with the three specimens in his herbarium. Both Smith and Woods suspected some error, but neither appears to have realized its full extent.

Winch was the first to call attention to the plant, in Bot. Guide, vol. i. p. 48, but without name, and in vol. ii. pref. p. 5, he gives the following note, also without a name:—"We have Dr. Smith's authority for considering this plant distinct from *R. tomentosa*. Its leaflets are densely covered with down, aculei long and straight, flowers numerous, large, and always white tinged with red at the extremity of the petals, its fruit is large in shape, rather resembling that of *R. villosa* than of *R. tomentosa*." Winch here obviously refers to his *mollis* form, and yet the plant figured by Smith, which is marked as coming from the very stations quoted by Winch, has a note on the plate, "midrib hairy at back," and has a broadly ellipsoid calyx-tube very unlike that of *R. mollis*. It is only the tip of a flowering-shoot, showing perfectly straight, rather short, subulate prickles, with low oval bases, leaflets broadly elliptical, very coarsely serrate but with the denticles hardly showing, flowers white blotched with red on the outside. Sepals spreading just after fall of petals, considerably pinnate. Peduncles rather long.

Smith has three specimens in his herbarium. No. 1, by Winch, from Newcastle, and No. 2 from Bury by himself, have quite straight subulate prickles; leaflets 5, rather broadly elliptical (more narrowly so in No. 2), hairy only on nerves and rough to the touch beneath, not glandular, or only scabrous on midrib. Flowers 1–3, rather long-peduncled, calyx-tube ellipsoid or narrowly so, hispid, sepals spreading or reflexed, pinnate, styles only visible in No. 2, where they are glabrous. The fruit is not formed, but the shape looks as if it could never be rounder than ovoid. No. 3, from Newcastle by Winch, is much more softly hairy, with a globose calyx-tube. It is much more like a *mollis* form.

With such material as a guide it is not surprising to find considerable variation in the specimens assigned to *R. scabriuscula* by British authors. Their prickles are usually rather stout, but rarely much curved. Leaflets large, elliptical, and well spaced, though there are many exceptions, and quite a large proportion of these are softly hairy both sides, though some of them agree with *R. scabriuscula* in most other respects. If, however, Smith intended to distinguish *R. scabriuscula* from *R. tomentosa* primarily by its subglabrous leaflets, these should be referred to the latter, even when slightly subfoliar-glandular, but I suspect the forms with conspicuous subfoliar glands must go to *R. fœtida* Bast. The styles in British specimens vary considerably in hairiness. *R. scabriuscula* should have them subglabrous or glabrous. The fruit is normally ellipsoid or ovoid, and the peduncles long, often several in a cluster, the sepals reflexed and deciduous. It is, I think, quite a frequent form in Britain.

Rosa fœtida

Bastard, Essai sur la Fl. de Maine et Loire, Suppl. p. 29 (1812).

"Rose with ovate calyx and peduncles hispid. Petioles prickly, prickles scattered and straightish. Leaflets ovate, acute, pubescent beneath.—Branching shrub, with prickles little curved, scattered. Leaflets ovate, acute, pubescent beneath. Flowers solitary. Peduncles and fruit hispid. Flowers rose.—This rose owes its name to the disagreeable odour of its parts, especially when rubbed. It seems to have some relation to *R. collina* Jacq., which is probably not that of the French Flora, for the latter has its peduncles and fruit glabrous, while Jacquin says the peduncles have glandular hairs."

Unless it be the odour, which is not easily defined, and not perceptible in the herbarium, there is nothing in Bastard's description by which this rose can be identified, so it may be helpful to quote Déséglise's description in Ess. Monog. p. 117:—"A tall shrub with long sarmentose branches, *exhaling a slight odour of turpentine when rubbed*, prickles *straight or inclined*; petioles pubescent, glandular, prickly beneath; leaflets 5–7, all petiolulate, the terminal rounded and sometimes a little cordate at the base, oval, acute, almost glabrous above, *pubescent, greyish, and sprinkled with scattered glands beneath*, nerved, doubly dentate, with open, glandular teeth; peduncles solitary or grouped in 2 to 4, hispid-glandular, furnished at their base with oval acuminate bracts, glabrous above, pubescent and glandular beneath, almost equalling or shorter than the peduncles; calyx-tube *ovoid oblong, hispid*; sepals covered with glands, pinnatifid, appendiculate, almost equalling the corolla, spreading in flower and then reflexed, not persistent; *styles glabrous*, disc salient; flowers light rose; fruit ovoid, dirty red. It differs from *R. rubiginosa* by its turpentiny odour, by its nearly straight prickles, its oval acute leaflets, greyish pubescent and scattered glandular beneath, its calyx-tube ovoid oblong, hispid, its flowers larger, light rose, and its ovoid, dirty red fruit." This comparison with *R. rubiginosa* seems superfluous, as it does not in the least resemble it, but Déséglise (*l. c.*) placed it among the *Rubiginosæ*. In the Cat. Raison., however, he transferred it to the *Tomentosæ*.

There is a specimen at Kew which was sent by Bastard to Gay. It has stout nearly straight or somewhat curved prickles. Leaflets oval or ovate acuminate, rather thinly pubescent both sides when mature, with rather few but fairly conspicuous green glands beneath. Petioles densely pubescent, a good deal glandular, with some hooked prickles. Stipules glandular on back. Peduncles 1–2, very long, hispid-glandular. Young fruit ellipsoid, hispid-glandular. Sepals fully reflexed on young fruit, considerably pinnate. Styles quite glabrous.

Déséglise has a considerable number of specimens, covering much range of variation. Their prickles are usually stout and declining though straight. The petioles vary greatly in pubescence, but are always a good deal glandular, though not much

prickly. The stipules are glabrous or somewhat pubescent and glandular. The leaflets vary from suborbicular and rounded at the apex to quite elliptical and acuminate, they may be subglabrous above and thinly hairy beneath, or rather densely hairy both sides, always with subfoliar glands, though they are often small and inconspicuous. Peduncles long, fruit ellipsoid, sepals spreading or reflexed, often long, broad, considerably pinnate, with broad segments, often not much glandular. Styles glabrous.

There are nineteen British specimens in Déséglise's herbarium from N.E. Yorks, Cheshire, W. Kent, Surrey, S. Hants, S. Devon, and E. Cornwall. They had been variously labelled by their collectors *R. tomentosa* var., *R. scabriuscula* Sm., *R. cuspidata* M. Bieb., *R. Jundzilliana* Bess., and var. *sylvestris* Woods. One of the Surrey specimens is var. *Woodsiana* Groves, and there is also the Cheshire plant referred to under the next species, but the others, which include other Surrey and Cheshire examples, are no doubt rightly named.

This species may be regarded as a variety of *R. scabriuscula*, having decidedly glandular leaflets, and quite glabrous styles. The leaflets are, as a rule, also broader and somewhat more hairy.

Rosa Jundzilliana

Baker in Review of Brit. Roses, p. 21 (1864) (non Besser).

"A vigorous bush with arching stem 5–6 feet high, and the habit and appearance of *R. tomentosa*. Prickles uniform, the base about $\frac{3}{8}$ in. deep, the prickles about the same length, the lower part moderately stout, the prickles curved but slightly, the point long and needle-like. Well-developed leaves of the barren stem from 4 to $4\frac{1}{2}$ in. from base to apex of terminal leaflet, which is broadly ovate or elliptical, rounded or even almost cordate at the base, and measures from $1\frac{1}{4}$ to $1\frac{1}{2}$ in. long by fully 1 in. wide. Leaflets full green above, thinly hairy all over when young, but becoming glabrous or nearly when mature, glaucous or greyish green beneath, thin in texture, hairy only on principal veins, but thinly covered all over the blade with green viscous mealy glands, the serrations open, and each furnished with two or three gland-tipped teeth, the petiole only thinly hairy, but plentifully setose, sometimes with three or four slightly curved aciculi, and sometimes several small setaceous ones in addition. Peduncles and ovate elliptical calyx-tube densely acicular and setose. Sepals $\frac{5}{8}$—$\frac{3}{4}$ in. long, ovate lanceolate, with the point not much lengthened out or dilated, mostly with 2–3 toothed leafy pinnæ on each side, tomentose towards the edges, rough on the back with setæ and aciculi, spreading out level after the petals fall, afterwards ascending. Petals pink, the flowers about the size of those of *R. tomentosa*. Styles thinly hairy. Fruit subglobose or broadly elliptical-urceolate, prickly or nearly naked, $\frac{3}{4}$—$\frac{7}{8}$ in. deep by $\frac{3}{4}$ in. broad, the sepals falling before it changes colour."

This description of course does not refer to Besser's species, which belongs to a different subsection, but is taken from

"Mr. Webb's original Cheshire plant, which had robust uncinate prickles, flowers often 6–10 in a cluster, and broad cordate leaflets" (Baker, Monogr. p. 218). But Mr. Baker confounded other plants with Webb's, and thought his No. 11, from Yorkshire, as well as other Cheshire specimens, to be the same. These latter are the specimens he refers to as "the average of the variety, as represented in my fasciculus, differing principally from *scabriuscula* by the leaves being considerably glandular beneath" (*l.c.*), and which constitute the plant typified by Mr. Baker's No. 11, from Boltby, near Thirsk, for which Déséglise proposed, but never published, the name of *R. britannica*, which name he afterwards dropped, since he believed it to be identical with *R. fœtida* Bast. Mr. Baker (*l. c.*) says: "I now believe my *Jundzilliana* to be essentially the same as Lindley's *sylvestris*." Here again he is referring to his "average" specimens and not to the original one of Webb's, and there is no doubt that Déséglise was right, *R. fœtida* and var. *sylvestris* being very nearly identical.

Webb's "original" plant was gathered by the bridge over the Greasby Brook, near Moreton, Cheshire, and has since been found by Harbord Lewis in two neighbouring localities, from which I have seen examples in Mr. Bailey's herbarium, but none from the other counties mentioned by Mr. Ley in Journ. Bot. 1907, p. 209.

The Cheshire specimens are characterized by the number and remarkable size and stoutness of the prickles on their main stems and barren shoots. They are declining or falcate, rarely uncinate. The leaflets also are very large, varying a good deal in shape from suborbicular to almost elliptical. They are densely tomentose (specimens from Woodhouse much less so), and always considerably glandular, but the glands are often sunk in the hairs. The petioles are strongly armed with many stout but small hooked prickles, many stalked glands, but not much hair. The peduncles are long and many in a cluster, strongly glandular-hispid, fruit ellipsoid, very glandular-hispid, with loosely reflexed, broad, flat, dark coloured sepals, with many glands on the back, and considerably pinnate, not falling early, all retained on the 17th August, the latest I have seen. Styles quite glabrous.

R. Jundzilliana Baker might be regarded as exceedingly strongly developed *R. fœtida*, but I think it deserves to be kept separate. It is at least very different to var. *sylvestris* Woods, and, as already explained, is not the plant intended by Déséglise to be covered by his *R. britannica*.

Rosa tomentosa var. sylvestris

Woods in Trans. Linn. Soc. xii. p. 202 (1817).

"Receptacle a long ellipsis, as setose on the peduncle; peduncles shorter than the bracteæ; aculei falcate; leaflets narrower than in *a*, slightly pubescent above, hairy and rough with glands on under side; surculi dark purple."

This is often quoted as *R. sylvestris* Lindl., but Lindley's de-

scription did not appear till 1841 (Synops. Brit. Fl. p. 101):—"Shoots erect, coloured, flexuose. Prickles hooked. Leaflets oblong, acute, hoary on each side. Sepals diverging, deciduous before the fruit is ripe. Fruit elliptical, setose."

Woods has two specimens from Sabine's garden at N. Mimms. Their prickles are stout and falcate; leaflets medium to large, oval, acute or acuminate, very thinly hairy above, more thickly so beneath, with rather numerous though rather small subfoliar glands, fully biserrate. Petioles densely pubescent, rather densely glandular, a little prickly. Stipules densely glandular on back, with rather long acuminate auricles. Peduncles 1–8, usually 2–3, rather long, a good deal hispid-glandular. Styles appear glabrous, but are difficult to see. The fruit is not formed, but the calyx-tube is ellipsoid, hispid-glandular. Sepals much pinnate, very glandular.

This variety is not mentioned by any foreign author, even in synonymy. It hardly seems sufficiently distinct from *R. fœtida* Bast., from which it differs in its more falcate prickles, more glandular leaflets, and often slightly hispid styles. Its more glandular leaflets and falcate prickles constitute the chief differences from *R. scabriuscula*. Its leaflets are almost always elliptical, almost glabrous above, and not much hairy, though considerably glandular beneath. There is, as usual, considerable variation. Those specimens which agree most nearly with the description have glabrous or thinly hairy styles.

Rosa tomentosa var. obovata

Baker, Monogr. Brit. Roses, p. 218 (1869).

"Prickles uncinate; leaflets obovate-oblong, with a subdeltoid base and very deep and compound upper teeth, grey-green, soon quite naked on the upper surface, thinly hairy and glandular beneath; the petiole densely downy, but not glanduloso-setose; the peduncles very short and quite hidden by the large sheathing bracts, which are nearly naked on the back, but glandular towards the edge; both the peduncles and glaucous oblong calyx-tube quite naked, and the sepals naked on the back."

I introduce this variety here, having omitted it from the group *coriifolia* of the subsection *Eu-caninæ*, being then of the opinion, as expressed in Journ. Bot. 1908, p. 364, that it was a *tomentosa* form. Further study convinces me that Crépin was right in referring it to the *coriifolia* group (Journ. Bot. 1896, p. 215), to which its claims to belong are even greater than some of the specimens I have seen labelled *R. Bakeri* and *R. Watsoni*, which, with one or two others, form a connecting link between that group and the present one.

I have seen Mr. Baker's original specimens, both at Kew and in Mr. Bailey's herbarium, from Eglestone, by road to Middleton, Teesdale. Their prickles are small but very strongly hooked, those on the main stem being very stout but short. Leaflets 5–7, of medium size, close set, more or less obovate, rounded or obtuse at

apex, decidedly pubescent above, at least when young, and always thinly so when mature; pubescent and greenish beneath, more or less covered with rather conspicuous green glands, compoundly serrate, the primary teeth deep and acute, the secondary also deep, acute, and irregular. Petioles very finely and shortly but not densely pubescent, with rather many subsessile glands, and a few hooked prickles. Stipules broad, very glandular, with rather short often cuspidate auricles. Peduncles 2–3, very short, hidden by bracts, smooth. Sepals broad with long foliaceous points, considerably pinnate, quite eglandular except on edges. Calyx-tube ovoid, fruit not developed. Styles apparently villous. Mr. Ley says, "sepals very slightly glandular, nearly simple, reflexed, caducous; fruit small, oblong or subglobose" (Journ. Bot. 1907, p. 210). I think he may have been misled by a fruiting fragment of some *tomentosa* form which I have seen on one of the sheets in Mr. Bailey's herbarium, and clearly out of place, but I have not seen specimens from the other stations quoted by Mr. Ley.

Foreign Species of the Group R. tomentosa.

As has already been stated, Continental authorities take a wider view of the *tomentosa* group and a more restricted one of that of *Sherardi* (*omissa*) than we do, consequently there are a large number of Continental species referred to the former which may occur in Britain, many of which would come under our definition of the *Sherardi* group. The three following at least should be noticed:—

R. farinulenta Crép. This is easily recognizable by its smooth peduncles and uniserrate leaflets. Déséglise at one time confounded it with *R. farinosa* Bechst., which, however, has biserrate leaflets and much more persistent sepals. There is a specimen at Kew from Richmond, Yorks, labelled *R. farinosa* by Mr. Baker, which it is not, as it has quite simple serration and smooth peduncles. It may be *R. farinulenta*, but it is too young to determine the persistence of the sepals. Moreover, it does not look like a *tomentosa* form at all, but rather a *dumetorum*.

R. dumosa Pug. This is nearly but not quite uniserrate, and has hispid peduncles. It is very near *R. cinerascens* Dum., but besides its sepals being deciduous much earlier, it has glandular and prickly petioles, larger leaflets, ovoid fruit, and villous styles, but intermediate forms occur. Many of the specimens labelled *R. cinerascens* Dum. belong here by their deciduous sepals. I have not seen it for certain from Britain, but suspect it may occur, having been mislabelled *R. cinerascens*.

R. confusa Pug. By description this is very like *R. scabriuscula* in appearance, differing in its more hairy, quite eglandular leaflets, and its longer-persistent sepals, which remain till the coloration of the fruit. It has numerous, long, straight prickles, elliptical or oblong leaflets, long peduncles, elongate ellipsoid hispid fruit, and glabrous styles. It is probable that some of our specimens labelled *R. scabriuscula* belong here.

SUBSECTION RUBIGINOSÆ.

The only constant feature by which this subsection can be distinguished from the *Eu-caninæ* is that of its leaflets being densely covered all over the lower surface with strongly scented glands, which are much larger and more conspicuous than is usual in other subsections, by which character its members are hardly likely to be confounded with any of the *Eu-caninæ* other than those of the *Borreri* group, or possibly the biserrate glandular-leaved forms of the *coriifolia* group. It sometimes approaches the *Villosæ*, some of which often have more or less scented subfoliar glands, but in that subsection the leaflets are almost always considerably more densely and softly hairy. The leaflets of the *Rubiginosæ* are always biserrate in British species.

It consists of four groups, *viz.* those of *R. Eglanteria*, *R. micrantha*, *R. elliptica*, and *R. agrestis*.

They may be divided in two ways—either by associating as subgroups *R. rubiginosa* and *R. elliptica* on the one hand, and *R. micrantha* and *R. agrestis* on the other, or treating the four as independent groups of equal rank.

The diagnosis under the first method is as follows:—

Group of *R. Eglanteria*. Tufted and compact, stems straight and stiff. Main prickles often unequal, though usually of the same shape, but there are often some acicles just below the inflorescence, and occasionally on stems. Leaflets as a rule rather small. Peduncles rather short, not as a rule longer than the fruit. Sepals usually erect or spreading, subpersistent at least till the fruit changes colour, pinnate. Flowers usually bright rose, rarely pale. Styles hispid or villous, stigmas in a short head.

Subgroup *R. rubiginosa*. Peduncles hispid, often aciculate. Leaflets oval or roundish, obtuse or rounded at apex, rounded at base, very rarely narrowed.

Subgroup *R. elliptica*. Peduncles smooth, rarely weakly hispid. Leaflets oblong, or oblong obovate, cuneate at base.

Group of *R. micrantha*. Usually lax, more or less arching. Main prickles all equal, very rarely with aciculi under the inflorescence, none elsewhere. Leaflets medium. Peduncles as long as or longer than the fruit. Sepals reflexed and deciduous, not much pinnate. Flowers usually pale. Styles glabrous or rarely hairy, usually rather long.

Subgroup *R. micrantha*. Peduncles hispid-glandular. Leaflets oval or elliptical, acute, rarely cuneate at base.

Subgroup *R. agrestis*. Peduncles smooth. Leaflets oblong or oblong obovate, cuneate at base.

The alternative method, which is the one I prefer, divides the subsection into four groups of equal rank by the following key:—

1 { Compact plants with straight stems. Prickles unequal, often mixed with a few acicles. Leaflets rather small. Peduncles rather short. Sepals erect or spreading, subpersistent. Stigmas hispid or villous in a short head 2
1 { Lax and arching. Prickles equal. Leaflets rather large. Peduncles rather long. Sepals reflexed and deciduous. Stigmas glabrous, rarely hispid, rather long..... 3

2 { Peduncles hispid-glandular, often aciculate, very rarely smooth. Leaflets oval or roundish obtuse, rounded or very rarely narrowed below ..... Group of *R. Eglanteria*.
Peduncles smooth, rarely weakly hispid. Leaflets oblong or oblong-obovate, cuneate at base ..... Group of *R. elliptica*.

3 { Peduncles hispid-glandular. Leaflets oval or elliptical acute, rarely narrowed at base ..... Group of *R. micrantha*.
Peduncles smooth. Leaflets oblong or oblong-obovate, cuneate at base ..... Group of *R. agrestis*.

GROUP OF ROSA EGLANTERIA.

Linnæus first described *R. Eglanteria* in Sp. Plant. ed. 1, p. 291 (1753), "*R. aculeata foliis odoratis, subtus rubiginosis.*" There is no doubt that this diagnosis was intended to define our common Sweet Brier, from the synonymy quoted by Linnæus, which is that of a plant with rose-coloured flowers. Moreover, he states (*l.c.*) that it grows in England, and mentions it in his *Flora Anglica*, together with *R. canina* and *R. spinosissima*. But in *Mantissa*, p. 504 (1771) he introduces the name *R. rubiginosa*, and says that his name of *R. Eglanteria* applies to a yellow-flowered species (since named *R. lutea* Mill.). This is an obvious mistake, and was possibly due, as Afzelius has suggested, to a loss of memory. The original name therefore must stand, but the definition is so vague that it is quite legitimate, and even desirable, to use *R. Eglanteria* in an aggregate sense only.

R. rubiginosa Linn. *Mantissa*, p. 504 (1771), is thus described: "*R. germinibus glabris petiolisque aculeatis, aculeis recurvis, foliis subtus rubiginosis.*—Branches smooth, but with scattered rather large recurved prickles. Leaves 7, pinnate, ovate acute, with scattered resinous specks (*atomis*) beneath. Petioles hispid, with small recurved prickles, as also the bracts, with minute pedunculate glands. Germen globose, rarely prickly, especially at the base. Peduncles with very minute prickles. Flowers purple.—*R. Eglanteria* differs in its taller stem and straight prickles, flowers larger, yellow, inodorous."

The members of this group are distinguished from those of the other groups in this subsection as follows. Their low growth and erect rather stiff habit will almost always distinguish them in the field from the *micrantha* and *agrestis* groups, while in the herbarium they can almost always be recognized by their more persistent, often quite persistent, sepals, and hispid styles. Their prickles are usually more or less unequal, some parts of the stems usually bearing acicles. Some species have a cluster of acicles just below the origin of the peduncles, but this is not a constant feature, moreover it undoubtedly occurs in some of the *micrantha* group. From the group of *R. elliptica* their hispid peduncles and much broader leaflets will almost always differentiate them, and these characters, taken in conjunction with those already mentioned, serve to mark them off from the *agrestis* group.

Key to British Species.

1 { Peduncles smooth ..... *R. jenensis* M. Schulze.
  { Peduncles hispid-glandular 2

2 { Main prickles considerably unequal, all or many straight, or if hooked, not strong. Leaflets small 3
  { Main prickles uniform or nearly so, stout and hooked. Leaflets medium (*R. rubiginosa* auct.) 4

3 { Prickles all straight or only slightly curved, slender. Styles villous. Fruit smooth or nearly so ..... var. *rotundifolia* Rau.
  { Prickles very numerous, the larger hooked. Styles hispid. Fruit hispid-glandular all over ..... *R. echinocarpa* Rip.

4 { Fruit subglobose. Peduncles hispid. Sepals erect or spreading but falling early ..... *R. apricorum* Rip.
  { Fruit ovoid, crowned by persistent sepals. Peduncles aciculate *R. comosa* Rip.

Rosa apricorum

Ripart in Déséglise Cat. Raisonné, p. 279 (1876).

"A tall, tufted, branched shrub, charged with numerous robust prickles, dilated, compressed at base, hooked or falcate, reddish or whitish, often degenerating at the summit of the branches into fine setaceous prickles; petioles pubescent, glandular, prickly beneath; leaflets 5–7, medium, roundish oval, oval-elliptical, with scattered adpressed hairs above, charged with fulvous scented glands beneath, nerves villous principally the midrib, doubly dentate with glandular teeth; stipules narrow, glabrous above, glandular beneath, fringed with glands, auricles acute divergent; peduncles solitary or in a small corymb, hispid-glandular, furnished with oval acuminate bracts, glabrous both sides, or glabrous above and with rare scattered glands beneath, glandular on edges, longer than peduncles; calyx-tube small, ovoid, contracted at summit, glabrous or hispid at base; sepals glandular on the back, spatulate at apex, two entire, three pinnatifid, with short gland-fringed appendages, salient in bud, reflexed in flower, then erect, deciduous; styles very hispid, disc almost flat; flowers rose; fruit roundish, blood-red when ripe."

There are two specimens collected by Ripart in herb. Déséglise. They have few hooked prickles, which do not degenerate into acicles under the inflorescence, but this is untypical; most of the other specimens bear acicles in that part, and they are mentioned in Ripart's description. Most of the flowering-branches in Ripart's two examples are quite unarmed. Petioles thinly pubescent, moderately glandular, usually with a good many small unequal prickles. Stipules rather broad, glabrous, but glandular on the back. Auricles rather short and broad, acute or apiculate. Leaflets small, broadly oval, rounded or obtuse at the apex, glabrous above when mature, rather densely pubescent on midrib beneath, and less so on secondary nerves, occasionally thinly so all over, rather densely glandular all over lower surface. Peduncles 1–3, short, about $\frac{1}{2}$ inch or less, glandular-hispid. Fruit rather small or medium, quite ovoid or even ellipsoid on one specimen, and subglobose on the other, smooth or nearly so. Sepals rather

short, with spatulate tips, and some broad pinnæ, erect on ripe fruit, then deciduous, not much glandular on back. Styles hispid.

There is only one British example in Déséglise's herbarium, *viz.* Mr. Baker's No. 37, cultivated at Thirsk, origin not stated. It has more numerous, more slender prickles than usual, small subglobose fruit, sepals fallen by Oct. 12th, and thinly hispid styles. It agrees otherwise with Ripart's specimens.

Of the five principal Continental authors whose arrangements I have consulted, *viz.* Crépin, Déséglise, Keller, Rouy, and Ripart, only the last-named keeps up a segregate *R. rubiginosa*, all the others using the name in an aggregate sense only. Although Ripart had described his *R. comosa* twenty-four years before Déséglise published *R. apricorum* Rip., it is not clear how Ripart himself intended to distinguish the two. In his own very original key, which was published in 1890 (Comptes Rendus Soc. roy. bot. Belg. xxix. pt. 2, pp. 99–116), he keeps the two together in a tribe, "*Comocarpæ*. Sepals persistent, crowning fruit," but the subdivisions of the tribe, which do not solve the difficulty, each contain six or seven species not distinguished from one another. He places *R. rubiginosa* Linn. in another tribe of equal rank, "*Sphærocarpæ*. Fruit spherical," which contains the species with deciduous sepals, though there is no reason to suppose, either from Linnæus's descriptions or herbarium, that he intended to restrict *R. Eglanteria* or *R. rubiginosa* to plants with deciduous sepals, but rather the contrary.

Other authors are not very explicit, but their opinions seem to be that *R. comosa* Rip. has more persistent sepals than *R. apricorum* Rip., while Rouy distinctly says the sepals of the latter never crown the fruit. Other leading features of *R. apricorum* are its globose fruit and not very strongly hispid-glandular peduncles, while *R. comosa* has an ovoid or obovoid fruit crowned by the persistent sepals, and aciculate-glandular peduncles. It will have been seen that in Ripart's own specimens he admits ovoid or even ellipsoid fruit into his *R. apricorum*, but the bulk of the specimens have it almost or quite globose.

Déséglise thought that the description of *R. rubiginosa* in the *Mantissa* referred to the plant now called *R. apricorum* Rip., while the specimen in herb. Linn. is *R. comosa*. This evidently was not Ripart's view, and the only satisfactory solution seems to be to follow the majority of authors who only use the name *R. rubiginosa* Linn. (i. e. *R. Eglanteria* Linn.) in an aggregate sense, and keep the segregate *R. apricorum* Rip. to distinguish the more globose-fruited forms with more or less deciduous sepals, which make up our common British segregate, though less common, I think, than *R. comosa*.

Rosa comosa

Ripart in Schultz Arch. de la fl. de Fr. et d'Allem. p. 254 (1852).

"It belongs to the section *R. rubiginosa*. Scarcely has *R. rubiginosa* lost its petals, and scarcely have its ovaries enlarged a

little, when the sepals reflex and fall, while the fruits are still green. In *R. comosa*, on the contrary, the sepals rise on the fruit, growing with it, their base becoming fleshy and red at the same time as it does, they persist and crown the fruit until its complete maturity. Besides this character, which seems to me fundamental, you may remark a difference in the form and size of the fruit and some of the secondary characters." Ripart *in lit. ad* Schultz.

Déséglise, in Ess. Monogr. p. 113, gives the following more detailed description:—"A tall branching shrub, with numerous robust hooked prickles, mixed at the top of the stems with other more slender straighter ones, those of the old stem whitish, of the branches fulvous. Petioles pubescent, glandular, prickly beneath. Leaflets 5–7, all petiolulate, the terminal rounded at the base, *oval or roundish*, glabrous or with scattered adpressed hairs above, *covered beneath with scented fulvous glands, villous on the nerves* especially the midrib, rough to touch, doubly dentate with open glandular teeth. Stipules narrow, the lower glandular beneath, glabrous above, the upper glabrous, all gland-ciliate, auricles acute divergent. Peduncles solitary or in a corymb, *hispid with fine prickles in the form of setæ ending in a gland*, furnished at the base with small, oval, acuminate, *glabrous*, gland-ciliate bracts, shorter than or sometimes longer than the peduncles. Calyx-tube glabrous, *ovoid*, hispid [*sic*]. Sepals glandular, pinnatifid with lanceolate appendages, gland-ciliate, reflexed in flower, then erect, exceeding or equalling the petals. *Styles hispid*. Flowers small, rose. Fruit *large, ovoid, orange-red, crowned by the persistent sepals with rather fleshy bases*. — Differs from *R. rubiginosa* [= *R. apricorum* Rip.] by its peduncles having fine prickles in the form of setæ ending in a gland, its glabrous bracts, ovoid calyx-tube, hispid styles, and large ovoid fruit crowned by persistent sepals. It differs from *R. umbellata* in its leaflets being villous, especially on the midrib, its ovoid calyx-tube, its persistent sepals, and its large, ovoid, orange-red fruit."

There are about fifty specimens in herb. Déséglise, but only one collected by Ripart. It has numerous, strongly hooked, uniform prickles, but with many acicles just below the inflorescence. The petioles are densely pubescent, not much glandular, but with many small prickles. Stipules glabrous, nearly eglandular, widening upwards, with rather short, broad, cuspidate auricles. Leaflets medium, oval, obtuse or suborbicular, hairs and glands much as in *apricorum*, teeth broad, open, fully biserrate. Peduncles 3–5, rather long, ¾ in. or more, rather densely hispid-glandular. Fruit ovoid, smooth. Sepals much as in *apricorum*, but longer, and some have fallen by July 30th, when the fruit had only begun to colour. The styles are hispid.

The differences between *R. comosa* and *R. apricorum* have been pointed out under the latter species.

Keller, in Asch. & Graeb. Fl. Mitteleur., after separating the species of the group which have white flowers, also those with eglandular peduncles or leaflets, divides the remainder into two

parts, namely those with stem-prickles of two forms, both hooked and more or less straight, and those with similar stem-prickles, though often with acicles just below the inflorescence. He makes *R. comosa* one of the principal and commonest species of the latter, with the following leading varieties :—

β apricorum (Rip.), a subglobose-fruited form with sepals spreading, not erect, and falling earlier than in *R. comosa*.

γ typica Braun has weaker, more slender prickles, globose or ovoid-globose fruit and short, spreading or early deciduous sepals. He quotes no synonymy, and it is not clear whether Braun meant this to be the type of *R. rubiginosa* or of *R. apricorum*.

δ *comosella* (Déségl. & Ozan.) is dwarf, with slender branches, long straight prickles, small, oval or elliptical, obtuse leaflets, and small, somewhat elongate fruit.

ε *dolorosa* (Déségl. & Ozan.) is sparingly prickly, with unarmed flowering-branches, glabrous stipules, leaflets hairy on midribs only, and elongate fruit narrowed at top.

Déséglise has only two British specimens. Mr. Baker's No. 53, from Tarbet, Argyle, is very like Ripart's specimen. It has stout hooked prickles, with acicles below the inflorescence. Peduncles 3–10, rather long. The fruit is ovoid, but too young to determine the ultimate direction of the sepals, which are long and little pinnate. A specimen by Briggs, from Lea Mill Bridge, S. Devon, is also too young, but an example from the same station, also labelled *R. comosa*, in the British collection, is probably from the same bush. It has many stout much hooked prickles, fairly uniform, but one or two much smaller, also a few acicles under the inflorescence, usually on the main branches of the corymb. Leaflets medium, broadly oval, rounded at apex, considerably pubescent above, densely so beneath, very glandular, fully biserrate. Petioles very glandular, a good deal pubescent, with some small pricklets. Stipules broad, with triangular acuminate auricles, eglandular on back. Peduncles 2–4, short, glandular aciculate. Fruit subglobose, smooth or nearly so. Sepals rather short, a good deal glandular, not much pinnate, spreading erect on August 29th. Styles hispid.

R. comosa is, I think, our commonest British segregate of *R. Eglanteria*, but is not always well marked off from *R. apricorum* Rip. on one side, and *R. comosella* Déségl. & Ozan. on the other. Its persistent sepals, ovoid fruit, aciculate peduncles, and uniform stem-prickles are its leading characteristics.

Rosa echinocarpa

Ripart ex Déséglise, Ess. Monogr. p. 110 (1861).

"Shrub with numerous unequal prickles, the smallest straight, the others recurved at the tip, dilated at the base. Petioles tomentose, covered with *stipitate shining glands*, prickly beneath. Leaflets 5–7, the lateral shortly petiolulate, the terminal rounded at the base, *oval obtuse*, *glabrous*, or lightly pubescent, *and with scattered glands above*, pubescent, and *covered with viscous scented*

glands beneath, doubly dentate with glandular teeth; stipules lanceolate, glabrous above, glandular beneath, gland-ciliate, auricles *acute, erect*; peduncles solitary or in a corymb, hispid with glandular setæ, *mixed with prickles two or three times as long as the setæ and not glandular*, furnished at the base with oval cuspidate bracts, glabrous above, charged with glands beneath, with glandular edges; calyx-tube . . .; sepals *villous* and charged like the peduncles *with glandular setæ mixed with small prickles*, lanceolate acuminate, pinnatifid with gland-ciliate appendages, reflexed in flower, then erect, connivent but not persistent till maturity. Styles *hispid*, disc flat; flowers . . . Fruit large, roundish ovoid, hispid with elongate prickle-like setæ, as long as one-third the diameter of the fruit, not gland-tipped."

The leading features of this species, as distinguished from the two foregoing, are its mixed stem armature and considerably glandular aciculate fruit. Crépin makes the fruit being aciculate all over the chief character by which this is diagnosed from all the rest of the group, which have it smooth or hispid-glandular at the base only, but it is not so constant a feature as has been supposed. Crépin also mentions as secondary characters that some of the leaflets are glandular above, the fruit large and the styles hispid. Déséglise, though he mentions the mixed stem armature, oddly enough credits the species with having no acicles under the inflorescence, whereas most of the specimens in his herbarium have them. It is not so distinct from *R. comosa* as descriptions imply, and runs especially rather near the form *R. comosella*.

Out of about twenty specimens in herb. Déséglise, only one has been gathered by Ripart. It is a small specimen in poor condition, but except for its remarkably mixed armature, agrees very closely with the description. Its prickles are just like those of a *spinosissima* hybrid; the main ones are hooked, but neither stout nor large, and they run down into very small though not quite acicular ones. The leaflets are small, oval, obtuse, glabrous, one or two being also considerably glandular above, all finely pubescent and densely glandular beneath, petioles closely pubescent, glandular and prickly. Stipules of medium width, glabrous, somewhat glandular on back, auricles acuminate. Peduncles in threes, of medium length, glandular-hispid, and with long eglandular acicles. Fruit large, ovoid, aciculate, but hardly at all glandular-hispid. The sepals have fallen. Styles stout, hispid.

He has three British specimens. Mr. Baker's No. 36 is a specimen of Woods's from Box Hill. It is only a scrap. It has straightish unequal prickles; leaflets small and close set, oval, rounded at apex, hairy both sides, not glandular above so far as can be seen, but most of the leaflets are reversed. Petioles densely pubescent and densely glandular. The inflorescence is mostly broken off, only one very short peduncle remaining hidden in the broad bracts. The calyx-tube is ovoid, aciculate only in the lower part, the rest smooth. The styles are glabrous, which is so rare

a character in the group that I venture to doubt the specimen belonging thereto, but to that of *micrantha*. I can find no mention of any glabrous-styled form of the group *Eglanteria*, and only one (*R. spino-urceolata* Crép., a Belgian form) that is described as having them even *thinly* hispid, though hispid and not woolly styles are common enough. Mr. Baker's No. 52, from Hill of Kinnoul, Perth, has normal stem-prickles, with many acicles below the inflorescence. The leaflets are small, oval or broadly so, glabrous and eglandular above, hairy chiefly on nerves and glandular beneath. Peduncles 1–3, rather short, glandular-hispid, and with long eglandular acicles. Fruit subglobose or broadly ovoid, with long eglandular acicles. Sepals spreading, pinnate, glandular aciculate. Styles hispid. No. 38 of herb. Groves, from Halstead, W. Kent, has very large stout hooked prickles with many acicles beneath the inflorescence. Leaflets rather large, broadly oval, broadly and shallowly biserrate, not much hairy though very glandular beneath. Peduncles 1–2, armed as in the Kinnoul specimen, as is the large subglobose or ovoid fruit. Sepals spreading (on Sept. 21st), a good deal pinnate, glandular and aciculate. Styles hispid. It was labelled *R. comosa* by Messrs. Groves.

It is probably a frequent British form.

Rosa rubiginosa var. rotundifolia

Rau, Enum. Rosar. p. 136 (1816).

"Calyx-tube subglobose, glabrous, peduncles glandular-hispid. Leaflets subrotund, twice smaller [than in *R. rubiginosa*], resinous-rubiginous beneath. Branches flagelliform, fewer, lax, branched, with straightish slender mostly geminate prickles.—Shrub 2–3 ft. high, branches fewer than in the other varieties. Prickles of branchlets mostly geminate, *slender, straightish*. Leaflets subrotund, ½ in. long, *scarcely longer than the prickles of the branchlets*. Calyx-tube *subglobose*, glabrous. Sepals appendiculate, glandular. Corolla small, deep rose. Flowers solitary."

This variety is ranged by Keller under those with similar stem-prickles, *i. e.* similar in shape, not in size. It is distinguished from *R. comosa* and *R. apricorum* by its prickles being much more numerous, slender, and straight or only slightly curved, also by the much smaller suborbicular leaflets. It would appear, however, from specimens in Déséglise's herbarium, that that author did not regard the straightness and slenderness of the prickles as of great importance, as there is a considerable admixture of specimens therein having them rather stout and hooked. I doubt whether Déséglise knew this variety well, as fully one-third of his specimens are named with doubt. He has none from Rau, and only one collected by himself. This has very numerous quite straight prickles of very variable size, but hardly running into acicles. Leaflets very small, not longer than the longer prickles, oval or broadly elliptical, rounded or subobtuse at apex, thinly hairy above, more so and scattered glandular beneath. Petioles glabrous, rather thinly glandular, with some fine prickles. Stipules

short, rather broad, smooth or thinly glandular, but much glandular-ciliate. Peduncles solitary, ⅓ inch long, thinly hispid-glandular. Fruit small, ovoid, smooth. Sepals spreading, with short but broad pinnæ. Styles hispid. Other specimens, as already stated, often have fewer, stouter, more hooked prickles, rather longer, less broad leaflets, globose fruit, and more erect sepals.

There are four British examples. No. 185 of Messrs. Groves, from Shoreham, W. Kent, has its prickles very numerous, long, slender, slightly curved, and irregular, but not very mixed. Leaflets oval, small, not much longer than prickles, glabrous above, thinly hairy, and glandular beneath. Stipules smooth or glandular on the back. Peduncles short, glandular-hispid. Fruit large, ovoid, crowned by erect, persistent sepals. Styles cannot be seen. Hailstone's No. 54, from Oglethorpe (Northumberland?), has stout barren shoots with very mixed prickles, the large ones very stout and hooked, well marked off from the numerous small, straight, more or less aciculate ones. Their armature is abnormal, and more like that of *R. echinocarpa*, and is a good object-lesson in the danger of collecting stout barren shoots. The flowering-stem has the usual long, slender, straight, unequal prickles. Leaflets small, oval, rounded at both ends, in a few of them narrowed below, clothing as in the Shoreham example. Peduncles ½ in., solitary, glandular-hispid. Fruit ovoid or broadly so, slightly glandular-hispid. Sepals spreading erect, glandular, not much pinnate. Styles rather thinly hispid. Mr. Baker's No. 36, from Meddon (?), N.E. Yorks, has smaller irregular prickles, less broadly oval leaflets much longer than prickles; otherwise it is like the Oglethorpe specimen, but with very small fruit. Briggs's No. 11, from Egg Buckland, S. Devon, has long, slender, unequal declining or curved prickles. Leaflets small, oval, obtuse, the larger much longer than the prickles, thinly hairy above, more densely so beneath. Fruit very small, but too young to give definite characters.

Rosa jenensis

M. Schulze in Mittelung. Geogr. Gesell. Thuring. zu Jena, iii. p. 79 (1884).

"Manner of growth, prickles, petioles, stipules, bracts, leaflets, length of peduncles, styles, and by its whole habit very near *comosa* Chr., but on closer inspection essentially distinct. The peduncles and calyx-tube are quite glabrous and eglandular, the sepals and their appendages are little long, eglandular on the back, somewhat glandular on the edges, often fully reflexed, not erect, and only comparatively seldom somewhat spreading, falling before the fruit ripens."

This very rare form, though known in several places in Central Europe, does not appear to exist in France. The only specimen I have seen is Mr. Marshall's No. 1236, from Boxley Warren, E. Kent. It has numerous, robust, hooked prickles, somewhat irregular in size, without acicles below the inflorescence. Leaflets

small, oval, broadly rounded at base, somewhat hairy both sides, densely glandular beneath. Petioles thinly pubescent or subglabrous, densely glandular, with several small prickles. Peduncles 3 together, about ½ in. long or less, quite smooth. Fruit smooth, quite globose, small. Sepals spreading (on July 31st), quite smooth on back, but glandular-ciliate, very little pinnate. Styles hispid or thinly so.

This cannot be mistaken for any other British form of the group. Its broad leaflets, broadly rounded at the base, distinguish it from the *elliptica* and *agrestis* groups. Three other varieties with smooth or almost smooth peduncles and sepals are known in Central Europe, but have features distinct from *R. jenensis*.

Foreign Species of the Group R. Eglanteria.

Although the foreign representatives of this group are many in number, there are few, I think, which come very near the British forms, or for which the latter might be mistaken.

R. umbellata Leers is one of the commonest Continental species. It is a stout form, with very stout hooked prickles, often mixed with smaller ones and also with acicles below the inflorescence, but sometimes the latter are absent. The peduncles are in clusters, the leaflets more hairy beneath than those of either *R. comosa* or *R. apricorum*, and the sepals reflexed and deciduous. Its fruit is large and smooth, normally ovoid though often subglobose, more rarely ellipsoid. The styles are villous. Though not identified as British, this form is quite likely to occur as one of those which go to make up our aggregate *R. Eglanteria*. Keller makes *R. echinocarpa* Rip. merely a bristly-fruited form of *R. umbellata* Leers.

R. comosella Déségl. & Ozan. has already been mentioned as a dwarf straight-prickled form of *R. comosa*, with small, oval or elliptical obtuse leaflets, and small somewhat elongate fruit. It is said by its authors to replace *R. comosa* in many parts of France as I think it does in Britain.

R. rubiginosa var. *Moutinii* Crép., var. *Gremlii* Christ, and var. *albiflora* Kell. are white-flowered varieties. The first two names have been suggested for Scottish specimens with white flowers, but without great confidence, and as there are some six or eight similar species on the Continent, I do not feel sure which name our white-flowered varieties should bear. Var. *Gremlii* is known by its few, but long, very remarkably hooked prickles of uniform size, without acicles below the inflorescence, also by its long peduncles, ovoid fruit, spreading or reflexed sepals not much glandular on the back, and longish hispid styles. Var. *Moutinii* has very unequal prickles, often, not always, with acicles below inflorescence, rather short peduncles, small ovoid fruit, erect persistent sepals, and densely woolly styles. Var. *albiflora* Kell. is the exact counterpart of *R. comosa*, but with white flowers.

GROUP OF ROSA ELLIPTICA.

This group is associated with that of *R. Eglanteria*, both being distinguished from those of *R. micrantha* and *R. agrestis* by their dwarfer and more compact habit, with straighter stiffer stems, also by their more erect persistent sepals and by their more or less densely hispid or woolly styles. From the *R. Eglanteria* group the members of the present one are distinguished by their relatively narrow, decidedly cuneate-based leaflets, and their smooth peduncles, though rare members of the *Eglanteria* group, such as *R. jenensis*, have them smooth, while occasionally hispid peduncles are met with in that of *R. elliptica*.

Though *R. elliptica* Tausch. is the oldest name in the group, and therefore stands for the type, a better known, though later, one is *R. graveolens* Gren. & Godr. It is a tolerably distinct group, and is fairly well represented on the Continent, but in Britain it appears to be confined to one, or at most two rare forms, which may be distinguished as follows:—

Peduncles villous or glabrous, not glandular-hispid. Leaflets pubescent on both sides, fully glandular beneath ..... *R. Billietii* Pug.

Peduncles glabrous. Leaflets glabrous above, thinly hairy and finely glandular beneath ..... *R. cryptopoda* Baker.

Rosa Billietii

Puget ex Crépin, Prim. Monogr. i. p. 337 (1869).

"Prickles more or less robust, all hooked. Flowering-branches rather short, more or less zig-zag, unarmed or prickly. *Leaflets rather small*, with more or less numerous adpressed hairs above, midrib and nerves *rather abundantly villous*, with more or less numerous scattered hairs between them, with *large and abundant glands* on the nerves and on the parenchyma, the lower narrowly obovate, strongly attenuate at the base, truncate or obtuse, the upper oval elliptic, narrowed at base, *broadened in the upper two-thirds, subobtuse or shortly acute*, teeth compound, very glandular-ciliate, the upper edges bearing 1–3 glands. *Petioles rather abundantly villous, very glandular*, the lower ones unarmed, the upper prickly. Stipules glandular beneath, at least the lower and middle ones, the upper narrower and little dilated. Flowers solitary, peduncles smooth, *rather abundantly villous* to the top, or on the lower two-thirds, moderately long, 8–15 mm. Flowering receptacle smooth, elliptical oblong, narrower and rather longly attenuate at the base. Sepals smooth on back, tomentose above, the pinnæ and apex abundantly glandular-ciliate, as long as corolla, *rising after flowering, spreading or suberect, and crowning the green fruit.* Corolla medium. Petals ——? *Disc almost flat.* Styles *villous*. Fruit ovoid (when green), a little inflated in upper two-thirds, sharply attenuate at base, or roundish ovoid, rounded at base."

The distinguishing features of this species in its group are its decidedly pubescent leaflets of medium size, most of the other species having them small and subglabrous, also its ovoid fruit

and hairy peduncles. Keller does not mention the latter feature, which may not be an important one; many species, at least among the *Eu-caninæ*, have a little fine hair on their peduncles.

There are six sheets in herb. Déséglise, none British, but five gathered by Puget, one of them being Billot's Exsicc. No. 3594, which appears to be regarded as the type. It has very stout prickles; leaflets small, narrowed at the base, rounded at the apex, very thinly hairy above, hairy and glandular all over beneath; petioles densely pubescent, glandular, with very small prickles. Peduncles solitary, from $\frac{1}{4}$–$\frac{3}{8}$ in. long, quite pubescent. Fruit subglobose. Sepals spreading or spreading-erect, rather short, not much pinnate. Styles densely villous or woolly. Crépin (*l.c.*) says that Puget told him he could always recognize this species among its allies at ten paces distance by its rusty colour.

Mr. Baker, Monogr. p. 224, places this as a variety of *R. sepium*, and describes it thus:—"Prickles of the main stem decidedly unequal, the main ones as large and as strong as those of the type, but only slightly hooked. Leaflets smaller; the terminal one 9–12 lines long by three-quarters as broad, obovate with a subdeltoid base; the upper surface at first slightly hairy, the lower thinly hairy and finely glandular all over. Peduncles naked; calyx-tube narrowly ovate-urceolate; the sepals, like those of *micrantha*, lengthened out at the point, but only sparingly pinnate; the styles hairy; the fruit ovate-urceolate, 7–8 lines deep."

There is a specimen at Kew from Bidford, Warwick, by Bree, which is perhaps not the same gathering as that seen by Mr. Baker and by Crépin, both of whom mention Allesley as its station of origin, the fact probably being that Mr. Bree cultivated it there from specimens collected at Bidford. Crépin says it was a cultivated specimen (*vide* Journ. Bot. 1896, p. 266), and thought it correctly named. The Kew specimen has rather small obovate leaflets, narrowed at base, rounded at apex, pubescent on both sides, glandular beneath, petioles densely pubescent, but not much glandular. The peduncles are glabrous and styles hispid.

The name is sometimes spelt *Billetii*, even by Crépin himself in his later writings, but the original spelling is *Billietii*, after Cardinal Billiet.

Rosa cryptopoda

Baker, Review of Brit. Roses, p. 22 (1864).

"Prickles somewhat unequal, the larger ones uncinate, and moderately robust below. Leaves from 3–3½ in. long from base to apex of terminal leaflet, which is ovate or elliptic, either rounded or somewhat narrowed towards base, and measures rather more than 1 in. long by ¾ in. wide. Leaflets greyish or glaucous green, glabrous on upper surface, still greyer beneath, hairy only on midrib and principal veins, but thinly scattered all over with green viscous glands, the serrations open but not deep, each furnished with several fine gland-tipped teeth, the petioles pubescent and setose, furnished with 2–3 falcate aciculi. Stipules

glandular on the back and even a little pubescent, the upper ones and the bracts very large, when the plant is in flower quite hiding the short peduncles, the bracts also glandular on the back but not hairy, all finely setoso-ciliate. Peduncles very short, quite naked, glaucous, and tinged with purple. Sepals $\frac{5}{8}$—$\frac{3}{4}$ in. long, naked on back, but somewhat hairy towards edges, the more luxuriant ones furnished with 3–4 erecto-patent toothed pinnæ on each side, all copiously setoso-ciliate. Petals deep red, the flower measuring about 1 in. across. Styles villous. Fruit subglobose, not at all narrowed at the neck, measuring about $\frac{5}{8}$ in. each way, ripening in September, by which time the erecto-patent sepals have fallen. —Comes near *R. sepium*, from which it differs in the size, shape, and colour of the leaflets, their hairy ribs and petioles, its peculiar bracts, stipules, and peduncles, subglobose fruit, slightly hairy sepals and villous styles. It is nearer still to the French *R. virgultorum*, but that has firm-textured green leaves, glabrous on both sides, more glandular beneath than in our plant, the terminal leaflet often much less narrowed at the base, petioles densely setose but not hairy, similar fruit, peduncles and sepals, but only slightly hairy styles."

The position of this species is doubtful. Mr. Baker places it as a variety of *R. sepium*, from which group it differs by its woolly styles, and if of the present subsection at all, it must belong to the *R. elliptica* group. I have not seen a specimen so labelled, but an unnamed example from the station and collector cited by Mr. Baker, *viz.* Luddenden, W. Yorks, by S. King, probably represents it. It has quite small hooked prickles, leaflets of medium size, rather close set, oval, glabrous above, thinly hairy all over beneath, but chiefly on the nerves, thinly scattered with fine inconspicuous glands beneath, not at all like the conspicuous stipitate glands of the subsection, fully but finely biserrate; petioles finely pubescent almost eglandular, unarmed; peduncles short, about $\frac{1}{4}$ in.; sepals erect after fall of petals in July, short and not much pinnate, not glandular on the back. Fruit (in a later and undated branch) quite globose, sepals fallen; styles quite woolly, more or less in a head.

To judge from this specimen, and indeed from Mr. Baker's description, the species is quite as near the *R. coriifolia* group as that of *elliptica*, but as I have some doubt as to whether the specimen really is *R. cryptopoda*, and in view of the fact that an unnamed duplicate thereof is placed by Déséglise to this subsection, and not to that of the *Eu-caninæ*, I leave it here provisionally. But Déséglise, strangely enough, does not place it with any of the species of the present group, with which its woolly styles should associate it, but to *R. sepium*, though with an expression of doubt, probably on account of its styles, so that its true position must remain doubtful. It is not recognized by any Continental author.

The Luddenden specimen bears much resemblance to specimens labelled *R. inodora* Hook., another species of doubtful group.

Foreign Species of the Group R. elliptica.

I have not seen any specimens in the British collections at Kew or South Kensington which are clearly referable to any other named continental forms of this group, but it is quite possible that such occur, and have been taken for forms of *R. agrestis*. The three most likely to be found are the following :—

R. lugdunensis Déségl. This is known from the rest of the group by its small, narrow leaflets, which are often, but not always, as hairy as those of *R. Billietii*, that is, more so than is usual in the group. Its small, globose fruit, on short, smooth peduncles, should sufficiently identify it. Its styles being woolly, and its spreading or erect-spreading long-persistent sepals at once distinguish it from *R. agrestis*.

R. Jordani Déségl. has relatively large, or at least broad, leaflets for the group. They are more glabrous than those of most of its allies, the petioles especially being glabrous or almost so.

R. cheriensis Déségl. has its leaflets very like those of *R. Jordani*, from which it may be readily distinguished by its large, long, ellipsoid fruit, and by its very numerous prickles. It has the erect subpersistent sepals of the group, but its styles, though quite hispid, are hardly so woolly as in the other species.

GROUP OF ROSA MICRANTHA.

The group of *R. micrantha* is separated from that of *R. Eglanteria* by its members having a taller, laxer, and more arching habit. Their prickles are stout and equal, leaflets of larger size, more oval, and acuminate, peduncles longer, sepals reflexed and deciduous, styles glabrous and longer, and fruit usually somewhat urceolate, but exceptions will be found in both groups. For example, in some of the *micrantha* group acicles may be found clustered beneath the inflorescence, or on the stems, while some of the *Eglanteria* group may be entirely without them. The main prickles also may be straightish and slender in the present group, stout and hooked in *Eglanteria*. Small suborbicular leaflets also may occur in both groups, but those of elliptical form are seldom found except in that of *micrantha*, which also seldom has obovoid though not unfrequently subglobose fruit, that of an obovoid form being a common, but by no means a constant, feature of *Eglanteria*. The styles seem to be constantly glabrous in our British forms of *micrantha*, and only exceptionally so in *Eglanteria*, in which latter also they are seldom so prominent as in *micrantha*. The sepals are never suberect or more or less persistent, as they frequently are in the *Eglanteria* group, in fact they are constantly so in certain species thereof.

The glandular hispid peduncles, and rather large leaflets, seldom cuneate at the base, differentiate the *micrantha* group from those of *elliptica* and *agrestis*, but var. *Briggsii* is an exception to the first character, while *R. hystrix* has the small cuneate-based leaflets of the *agrestis* group.

Key to British Species.

1 { Peduncles smooth. Leaflets large, broadly oval, thinly glandular beneath..... var. *Briggsii* Baker.
{ Peduncles glandular hispid..... 2

2 { Prickles long, straightish, often with fine acicles on stem. Leaflets rather large and broad..... *R. sylvicola* Déségl.
{ Prickles uniform, hooked. Leaflets oval or elliptical 3

3 { Leaflets small and narrow, cuneate at base. Fruit small, broadly ovoid or subglobose..... *R. hystrix* Lém.
{ Leaflets broader, rounded at base, or if somewhat cuneate, then larger. Fruit ovoid, ellipsoid, or suburceolate 4

4 { Flowering branches prickly. Fruit usually smooth. Leaflets oval, subglabrous, or only slightly hairy beneath... *R. permixta* Déségl.
{ Flowering branches unarmed or nearly so. Fruit often hispid. Leaflets elliptical, pubescent all over beneath, or or least on the secondary nerves..... *R. micrantha* Sm.

Rosa micrantha

Smith, Eng. Bot. tab. 2490 (1812).

"Fruit oval, somewhat bristly as well as the footstalks. Stem straggling, with scattered hooked prickles. Leaflets ovate acute, clothed beneath with rusty glands. Mr. Borrer observes that it is common in hedges and thickets, and is nearly related to *R. rubiginosa*, but much less prickly, more bushy, and more like *canina* in mode of growth. The leaflets are less rounded, less rusty beneath, and not so fragrant as those of *rubiginosa*. Its flowers are smaller and paler, being less than in any other British Rose. Fruit with a more gradual neck, not of the pear-like shape usual in that species. It varies in roughness. The footstalks and backs of the leaves are downy as well as glandular."

Smith gives a somewhat fuller description in Eng. Fl. ii. p. 387, thus:—"Branches much more weak and slender than the last (*R. rubiginosa*). Prickles fewer, either solitary or in pairs under the leaves and young branches, rarely in any other part, nor are there any small and straight ones interspersed. Leaflets broadly oval, acute, of a rather deeper green than in *R. rubiginosa*, and less rusty, though glandular beneath. They are also far less fragrant. Flowers light rose, usually small, but this mark is said to be variable. Tube of the calyx ovate, with contracted cylindrical neck; its surface in some degree bristly, especially at the base, though the prickles thereabouts are not so long as they are in *rubiginosa*. Segments of limb not very much pinnate, falling off as the fruit ripens. The latter is scarlet, sometimes quite smooth, and retaining its oval form, with a short neck, and generally smaller than the hip of *rubiginosa*."

The plant described by Déséglise in Ess. Monogr. p. 115, under the name of *R. micrantha* Sm., is not that of Smith, but a much smaller species in every respect. The description which applies to Smith's species is found under the name of *R. nemorosa* Lib. (Lej. Fl. Spa, Suppl. p. 313, 1813), which is now regarded as synonymous. I transcribe Déséglise's description of the latter in full (Ess.

Monogr. p. 114), as without it it would be most difficult to segregate plants placed by him to Smith's species from those of his own *permixta* :—" Shrub, 1 metre high, much branched, with numerous robust hooked prickles on the old wood, *flowering branches almost unarmed* ; petioles pubescent, glandular, prickly beneath ; leaflets five, rarely seven, petiolulate, the terminal narrowed at base, *small*, pale green, *elliptical acute*, some rounded at apex, glabrous or with adpressed scattered hairs above, pubescent and glandular beneath, doubly dentate with glandular teeth; stipules very narrow, glabrous above, glandular beneath, with diverging auricles ; peduncles usually solitary, glandular hispid, furnished at their base with *two small oval glabrous* bracts, gland-ciliate, and shorter than the peduncles ; calyx-tube ovoid-oblong, glandular, sepals glandular, little cut, with filiform appendages, almost exceeding the corolla, reflexed in flower, not persistent. Styles glabrous or nearly so, flowers small, light rose, fruit red, ovoid, rounded at base, attenuate at apex. Differs from *rubiginosa* in its flowering branches almost unarmed, its small elliptical acute leaflets, pubescent and glandular beneath, its small glabrous bracts shorter than the peduncles, ovoid-oblong calyx-tube, glabrous styles, ovoid fruit, rounded at base, attenuate at apex. Differs from *septicola* in being much lower, leaflets smaller, glabrous bracts, ovoid-oblong calyx-tube, ovoid fruit, rounded at base, attenuate at apex."

There are three specimens in Smith's herbarium. No. 1, collected by Borrer in Sussex, has its prickles few and hooked, leaflets five, well spaced, rather large, oval acuminate, glabrous above, hairy all over beneath, especially on veins, and rather densely glandular ; petioles densely pubescent, not much glandular nor prickly; stipules narrow ; peduncles 1–3, ½–1 in. long, glandular hispid. Calyx-tube ellipsoid, glandular at base ; styles long, loose, glabrous ; sepals long, spreading-reflexed, pinnate. No 2 is a specimen from the Caucasus. No. 3 is labelled "hedges in Scotland." It is an unarmed flowering branch, with many acicles just below the inflorescence ; leaflets seven, large, broadly oval, rounded at apex, slightly hairy beneath, petioles subglabrous, glandular and aciculate. Peduncles in a cluster of six, aciculate, as is also the calyx-tube. Styles short, quite hispid. Sepals spreading, pinnate.

It is curious that Smith, while expressly excluding acicles in his description, should have admitted such a specimen as his No. 3. He had, indeed, originally labelled it *R. rubiginosa*, which it appears really to be from its hairy styles, its seven broad rounded leaflets, its acicles, and, so far as can be judged, its calyx-tube. Specimens of *R. micrantha*, and other species in the group, undoubtedly occur with acicles under the inflorescence, but they are rare, and this character is usually associated with the normal ones of the group.

The normal features of *R. micrantha* are its uniform and rather few prickles, very rarely with acicles at the top of the flowering stems, though I have seen British examples, named on good authority, which show this feature. The flowering stems are

often quite unarmed. The leaflets are usually five; they are much more acuminate and less glandular than in *R. Eglanteria*. The fruit is more ellipsoid, and whereas in *Eglanteria* there is often a tendency to an obovoid form, in *micrantha* it is very often narrowed towards the apex, so as to be urceolate. The sepals are almost always reflexed and deciduous, never erect and subpersistent as in *Eglanteria*. The styles are long and glabrous, or very rarely thinly hispid. Its nearest ally is *R. permixta* Déségl., and even Déséglise himself was often in great doubt as to which of the two his specimens should be referred to. The differences are dealt with under that species. It is a frequent and fairly generally distributed species in Britain.

Rosa permixta

Déséglise, Ess. Monogr. p. 107 (1861).

"A tall tufted bush, charged with numerous, stout, unequal prickles, dilated at the base, hooked. Petioles pubescent, charged with glands, prickly beneath. Leaflets 5–7, *oval*, *rounded at base*, *or oval elliptic*, shortly petiolulate, the terminal longly so, rounded at base, obtuse at apex, glabrous or with scattered hairs above, *pubescent on nerves beneath*, charged with fulvous, scented glands, doubly dentate, with glandular teeth; stipules narrow, pubescent, glandular beneath, glabrous above, auricles diverging. Peduncles solitary or in a small corymb, hispid-glandular, with oval acuminate bracts at their base, glabrous above, *villous* beneath, ciliate and bordered with pedicellate glands, equalling or shorter than the peduncles. Calyx-tube *ovoid*, *glabrous or hispid at the base only*. Sepals glandular, a little tomentose at the edges, pinnatifid, with narrow appendages, fringed with pedicellate glands, reflexed in flower, then erect, not connivent, deciduous before maturity; styles *glabrous*, disc a little salient, flowers rose, *fruit ovoid*, glabrous, red.—This is the *R. rubiginosa* of those authors who describe their plant with ovoid fruit, while Linnæus said '*germinibus globosis.*'"

Déséglise has about twice as many specimens of *R. permixta* in his herbarium as he has of *R. micrantha*, but in very many cases seemed in doubt as to which species to place them to. He has no British specimens; Mr. Baker's Surrey specimen, which he cites, not being in his herbarium. His own No. 72 has rather few, not very stout nor much hooked prickles; leaflets medium, broadly oval, subobtuse at each end, scattered hairy beneath, chiefly on the veins; petioles not densely pubescent, scattered glandular and prickly; stipules rather broad, glandular and hairy on the back, with acuminate auricles; bracts hairy but not glandular; peduncles 1–6, rather short; fruit ovoid or urceolate; sepals thinly glandular on the back, a good deal pinnate, fallen by Oct. 2nd. Many of his other specimens have their leaflets narrowed, rather than rounded below, sometimes very decided so. The fruit is usually smooth or nearly so.

This species is very near indeed to *R. micrantha*, and is often

indistinguishable from it. The more numerous prickles, especially on the flowering-branches, its more glabrous leaflets, and smoother fruit, constitute the chief points of difference. Its author mentions more erect sepals, but this is not evident on his specimens. In his key in Cat. Rais. (p. 278), Déséglise contrasts the two thus: "Leaflets oval, flowers rose—*R. permixta*. Leaflets elliptical, flowers light rose—*R. micrantha*"; but both forms of leaflets may be found on the same bush of either species, and the distinction in the colour of the flowers is trifling and unstable.

Mr. Baker (Monogr. p. 220) places *R. permixta* as a variety of *Eglanteria*, saying, "Leaves in our plant quite without hairs, but as densely glandular on the under surface and petioles as in the type; styles quite glabrous; fruit ovate-urceolate, half as long again as broad, and decidedly narrowed at the neck, densely prickly, the sepals fallen before it reddens. This recedes from the type towards *micrantha* by the naked styles and shape of the fruit, but in other respects agrees with the type." His description of the leaf-clothing and the "densely prickly" fruit is not in accordance with Déséglise's.

Rosa hystrix

Léman in Bull. de Science, Soc. Philomat. de Paris, p. 95 (1818).

Léman's description is only part of a key, and by itself is quite insufficient to identify the species. The key will be found in full in "The Subsection *Eu-caninæ*" (Journ. Bot. Suppt. 1908, p. 19), and is here abbreviated:—

I. Leaves simply dentate.
II. Teeth of leaves serrate on the lower side.
III. Leaves with teeth serrate and glandular on both sides.
a. Peduncles hispid.
* Leaves eglandular, villous beneath.
** Leaves eglandular, pubescent both sides.
*** Leaves glandular.

i. Fruit globose . .	*R. tenuiglandulosa* Mér.
ii. Fruit elliptic . .	*R. rubiginosa* Linn.
iii. Fruit elongate . .	*R. histrix* Lém.

It will be noticed that Léman's spelling of the name *histrix* is not that universally adopted now.

The name *R. hystrix* is not in common use on the Continent, the much more modern one of *R. Lemanii* Bor., which its author makes synonymous with Léman's name, having supplanted it, though if Boreau's synonymy is to be accepted, the name of *R. hystrix* must stand.

Boreau's description of *R. Lemanii* in Fl. du Centre de la Fr. ed. 3, p. 230 (1857), is as follows:—"Shrub with slender flexuose branches, bearing a number of alternate short flowering-branches; prickles hooked, leaflets small, oval or elliptical, doubly glandular-dentate, pubescent, and much charged with glands beneath. Peduncles hispid, solitary or in clusters. Calyx-tube oblong, smooth or hispid at the base. Flowers rose, rather small."

It may be of assistance to give Déséglise's description of *R. Lemanii* Bor. from Ess. Monogr. p. 102, for comparison with those he gives of the other species in this group:—"Shrub with *flexuose flowering-branches*, alternate along the stem, prickles hooked, compressed at the base. Petioles *charged with glands*, and feebly prickly beneath. Leaflets 5, all petiolulate, the terminal acute at the base, *small, oval or elliptical, acute at the base*, glabrous above, covered with fulvous glands beneath, *with the midrib more or less villous*, doubly dentate, with open glandular teeth. Stipules narrow, glabrous above, glandular beneath, auricles acute, straight. Peduncles short, hispid, solitary or in clusters, furnished at their base with oval acuminate glabrous bracts fringed with glands, longer than the peduncles. Calyx-tube oblong, smooth or hispid at the base; sepals glabrous, pinnatifid, with linear appendages, fringed with glands, tomentose within, and a little on the edges, exceeding or equalling the corolla, reflexed in flower, not persistent. Styles glabrous, a little combined into a short column, disc flat. Flowers rather small, rose. Fruit small roundish.—It differs from *R. sepium* in its oval leaflets, not acute at each end, the midrib more or less villous, peduncles hispid, calyx-tube oblong and sometimes hispid at the base. It approaches *R. Klukii* by its styles being combined into a short column, but differs in its petioles being only glandular, its small leaflets, glabrous bracts, calyx-tube sometimes hispid at the base, the sepals falling earlier, glabrous styles, small flowers and roundish ovoid fruit."

The *R. Klukii* referred to by Déséglise is a species of Besser's, which has been much misunderstood. It appears to connect *R. elliptica* with *R. Eglanteria*.

There is a small and very unsatisfactory piece of *R. hystrix* at Kew, from Gay's herbarium, to whom it was sent by Léman. It is the slender and much-branched end of an old and weak flowering-stem. Its two prickles are rather slender and only moderately curved. Its leaflets are five, oval or broadly so, subcuneate at the base, with curly white hairs above, not densely hairy nor very glandular beneath; toothing coarse. Petioles rather densely pubescent, not very glandular, and scarcely at all prickly. Peduncles solitary, about ½ inch. Fruit very small and apparently abortive, ovoid, thinly glandular-hispid. Sepals reflexed. Styles glabrous, short.

Déséglise's No. 71, which he cites in Cat. Rais. p. 293, has rather stout, moderately hooked prickles. Leaflets rather small, elliptical, rather decidedly narrowed below, subacute at the apex, acutely biserrate, hairy only on midrib beneath. Petioles subglabrous, but glandular and prickly. Stipules rather narrow, glabrous, but glandular on back, with acuminate auricles. Peduncles 1–3, hispid-glandular, short or medium. The fruit is very small and ovoid, but appears abortive, as in Léman's specimen. Most of Déséglise's specimens have it subglobose. The sepals are a good deal pinnate, not much glandular on the back, reflexed, and deciduous. Styles glabrous.

I have not seen satisfactory British specimens; the two in Déséglise's herbarium are both marked with doubt, and rightly so, as they are considerably off type. Mr. Baker's No. 23, from Box Hill, has suborbicular leaflets quite uncharacteristic for *R. hystrix*; they are also decidedly more hairy, its fruit is broadly ovoid. Messrs. Groves's No. 29, collected by Brotherston at Yetholm, in Roxburgh, has just similar leaflets to those of the Box Hill plant, and is still more untypical in its ellipsoid-urceolate fruit. Both these specimens might rather have been labelled *R. permixta* Déségl. Mr. Baker's short description in Monogr. p. 222, is good. He also records it from Caversham, Oxfordshire, and St. Vincent's Rocks.

The species is marked by its small narrow leaflets, very like those of *agrestis*, but though cuneate at the base, as in that species, they are not so at apex, being seldom more than subacute, and often quite rounded. They are nearly glabrous beneath, only the midrib as a rule being hairy. The fruit is roundish ovoid, and its peduncles hispid-glandular, which at once distinguishes it from *R. agrestis*. It has long virgate stems, with short alternate flowering-branches, and in its typical form should be easily recognized.

Rosa micrantha var. Briggsii

Baker, Monogr. Brit. Roses p. 222 (1869).

"A luxuriant variety with leaflets 15–18 lines long, 10–12 lines broad, naked above, less glandular than the type beneath; calyx-tube and fruit shorter and stouter, and, like the peduncles, quite naked; sepals more pinnate and scarcely glandular on the back."

Briggs's specimens at South Kensington are much larger and laxer than is usual in the group. The prickles are few, stout, and hooked. Leaflets five, well spaced, large, broadly oval or broadly elliptical, glabrous above, hairy chiefly on midrib beneath, not much, and on some leaflets scarcely at all, glandular; petioles very pubescent, moderately glandular, with several small hooked prickles. Stipules narrow, with rather long acuminate auricles, smooth or slightly glandular on back, not strongly gland-ciliate. Peduncles 1–3, sometimes rather short, sometimes long. Fruit small, broadly ovoid or subglobose, contracted below the disc. Sepals long and considerably pinnate, reflexed, not glandular on back, but somewhat gland-ciliate. Styles glabrous, shortly projecting."

This is an endemic and very local variety, having been found only in the neighbourhood of Plymouth, where it has been gathered in several different stations, though it does not appear to occur in Cornwall. Briggs thought that specimens from St. Thomas's Head, Somerset, collected by Mr. White, were this variety, but Mr. Baker and others held firmly to the opinion that they were only a form of *R. agrestis*, an opinion afterwards confirmed by Crépin (see Rept. Bot. Exch. Club for 1888, p. 215), who saw a good series of var. *Briggsii* from Plymouth. The

latter variety, he says, is correctly referred to *R. micrantha*, and differs from *R. agrestis* in the form of its leaflets.

From its smooth peduncles and comparatively little glandular leaflets this variety might perhaps be referred to a form of *R. Borreri*, but the general shape, dentition, and colour of its leaflets are those of the present group. Its very broad leaflets should prevent any confusion with *R. agrestis*.

Rosa sylvicola

Déséglise et Ripart in Mém. Soc. Acad. de Maine et Loire, xxviii. p. 122 (1873).

"Small shrub, 1 m.–1 m. 2 cm. high, branches slender, flexuose, pendent. Prickles *long*, dilated in the form of a disc at the base, unequal, *inclined or straight, but not hooked*, those of the branches *weak*, slender, long, straightish, *degenerating at the summit into setaceous prickles*. Petioles villous, glandular, prickly beneath. Leaflets 5–7, all petiolulate, glabrous above, or with scattered adpressed hairs, glandular pubescent beneath, with fine glands, giving out an odour of russet apples when rubbed, oval or roundish oval, doubly dentate with open teeth, the secondary glandular. Stipules narrow, glabrous above, with *scattered* glands and hairy beneath, fringed with glands, auricles diverging. Peduncles hispid-glandular, furnished at the base with a *glabrous* bract, leafy at the tip, with glandular edges, longer than the peduncle. Calyx-tube *ovoid*, hispid at the base. Sepals spatulate, glandular and villous at tips, two entire, three pinnatifid, with appendages fringed with glands, salient in bud, equalling the corolla, reflexed in flower, deciduous. Styles short, *glabrous*, disc almost flat. Flowers *small*, rose. Fruit red, ovoid, a little contracted at the top.—Differs from *R. rubiginosa* in its habit, prickles, leaflets, stipules, bracts, glabrous not villous styles, and fruit. From *R. septicola* in its branches not forming a tufted bush, its prickles, its styles, bracts and fruit. From *R. permixta* in habit, prickles, leaflets, bracts, flowers, and fruit. It cannot be confounded with *R. rotundifolia* by the shape of its prickles, and it also differs in its larger leaflets, its bracts, ovoid calyx-tube, its styles glabrous not villous, and its fruit ovoid not globular."

The description written by Déséglise on one of his sheets reads: "This *may* be confounded with *R. rotundifolia* by the shape of its prickles, &c.," which is no doubt what he intended to say in his published description.

There are two specimens collected by Déséglise and one by Ripart among those in the former's herbarium. They have rather long, unequal, straightish or curved prickles, which, in one specimen, run into acicles on the branches, and all have a few acicles below the inflorescence. The leaflets are usually five, large, broad, oval, and subobtuse, glabrous above, or thinly hairy when young, pubescent beneath and not very glandular, triserrate, *i. e.* the main teeth so irregularly denticulate as to be themselves practically biserrate. Petioles closely, densely pubescent, not much

glandular nor prickly. Auricles acuminate. Peduncles solitary, ¾–1 in., glandular-hispid. Fruit ellipsoid, smooth. Styles glabrous. Sepals all fallen in August. Other specimens in the cover differ in the prickles often being hooked, and the leaflets small.

Déséglise has two British specimens. Baker's No. 35, from Gunnerside, Swaledale, has slender, straight, or hardly at all curved prickles. Leaflets five, small, oval or elliptical, acute, glabrous above, hairy on midrib and veins, and thinly glandular beneath. Petioles closely pubescent, prickly but not much glandular. Stipules broad. Peduncles solitary, long, glandular-hispid. Calyx-tube ovoid, glandular-hispid. Sepals much pinnate, reflexed. Styles almost glabrous. A specimen from Briggs, collected between Tamerton Foliot and St. Budeaux, is named with doubt by Déséglise. It has few, quite hooked prickles, which probably gave rise to the doubt, but there are acicles below the inflorescence; leaflets medium, elliptical or oval, five, rarely seven, thinly hairy both sides, or rarely densely so beneath, not very glandular; petioles a good deal glandular, thinly hairy, almost unarmed; peduncles five in a cluster, ½–⅝ in. glandular-hispid. Briggs thought this a globose-fruited form of *R. micrantha*.

There are also two specimens so named in the British collection. One from Sprowston, E. Norfolk, by Rev. E. F. Linton, has long, rather slender, but hooked prickles, no acicles under the inflorescence, broadly obovoid or almost subglobose fruit, and thinly hairy styles. It looks to me more like *R. apricorum*. Its sepals have fallen by September. The other specimen, by W. R. Linton, from Graffham, Hunts, has more straight prickles, with acicles below the inflorescence, rather long peduncles, ovoid glandular-hispid fruit, and spreading-reflexed sepals. Except that its styles are thinly hispid, it appears to be correctly named.

Déséglise contrasts this in his key with species of the *Eglanteria* group, so it is not clear how he distinguished it from the rest of the *micrantha* group; but in its typical form it is a small bush, with long, straightish, slender, often unequal prickles as its leading feature, thus giving it much the same relationship to *R. micrantha* that var. *rotundifolia* bears to *R. Eglanteria*. Its leaflets, however, are, as a rule, rather large, though this is not a very constant character. It forms one of the exceptions to the present group in often having acicles under the inflorescence. Its glabrous styles will, as a rule, differentiate it from the *Eglanteria* group, the only member of which it is otherwise likely to be confounded with being var. *rotundifolia*, but that also has villous styles.

Foreign Species of the Group R. micrantha.

R. micrantha in Europe forms a large group, second in size only to that of *R. Eglanteria* in this subsection, and it is quite likely that research will reveal several named forms in Britain, at least as distinct from those described above, as *R. permixta*, which has long been admitted into our lists, is from *R. micrantha*. The

two most likely to occur, either from their frequency or their distribution on the Continent, are the following :—

R. septicola Déségl. is very near *R. permixta*, differing primarily in its large leaflets and subglobose fruit. Déséglise mentions also its pubescent bracts, but these are not always so, and they are often pubescent in other species, including *R. permixta*, so that it must not be taken as a very reliable character.

R. operta Pug. is also very near *R. permixta*, but has the long unarmed flowering-branches of *R. micrantha*, though usually with acicles at the top. It has larger leaflets than those of *R. micrantha*, hairy only on the midrib, and ovoid or ellipsoid fruit, which may be smooth or hispid. This and three or four other species are the only ones known to me in the group which are described as having acicles under the inflorescence.

GROUP OF ROSA AGRESTIS.

This group stands in much the same relation to that of *R. micrantha* as the *R. elliptica* group does to *R. Eglanteria*. It agrees with the *R. micrantha* group in the lax arching habit of its members, their uniform prickles, biserrate leaflets, longish peduncles, reflexed and deciduous sepals, and usually, though not invariably, glabrous styles; while they differ primarily in their smooth peduncles, also in their leaflets being smaller and narrower, and acute at both ends, or at least at the base. The flowers are usually white, except sometimes in *R. sepium*. On the Continent it has about as many members as the *R. elliptica* group; but in Britain, although rare, it is more frequent than that group, both in species and individuals.

Key to British Species.

1 { Leaflets glabrous beneath, or thinly hairy on midribs only 2
  { Leaflets pubescent all over beneath, or at least on secondary nerves 3

2 { Leaflets very small. Fruit small, ellipsoid. Styles quite glabrous ..... *R. agrestis* Savi.
  { Leaflets larger. Fruit more ovoid, rather large. Styles occasionally slightly hispid ..... *R. sepium* Thuill.

3 { Styles glabrous or nearly so. Fruit globose. Leaflets small ..... *R. belnensis* Ozan.
  { Styles quite hispid ..... *R. inodora* Fries.

Rosa agrestis

Savi, Fl. Pisana, p. 475 (1798).

"Rose with germen and peduncles glabrous. Flowers subumbellate. Leaflets oval, dentate-serrate. Stem and petioles prickly.—The stems rise to 8 or 10 feet, and are strong enough to support themselves, with many diffuse interlacing branches, covered with very strong curved prickles. Leaflets 3–5 or 7, oval or oval-lanceolate; dentate, with saw-like teeth, hairy and deep green above, glandular and reddish beneath. Petioles minutely prickly on the lower side. Flowers scented, in an umbel, 3 or 4

together, petals white, slightly emarginate. Peduncles and germen glabrous. The glands in this species are reddish and pedicellate, giving a reddish colour to the under surface of the leaflets, and emitting a smell. These glands are situated on the serratures of the leaflets, on the bracts, stipules, and on the edges of their segments. Flowers in June; fruit, which is an inch long, and elongate-oval, ripens in September."

Déséglise's description in Ess. Monogr. p. 104, is:—"A small branching shrub, with greenish, divaricate, pendent, spiny branches, the prickles on the old wood rather strong, dilated at the base, almost straight, those of the young branches smaller, geminate. Petioles glandular, prickly beneath. Leaflets 5–7, shortly petiolate, the terminal longly so, acute at the base, *small*, *oval*, acute at each end, glabrous above, *a little glandular beneath*, serrate, with glandular teeth. Stipules narrow, glabrous above, with scattered glands beneath, and glandular edges. Auricles divergent. Peduncles short, glabrous, solitary, rarely two together, with two opposite, oval, acute, glabrous bracts at the base, bordered with glands, and hiding the peduncles. The inner sepals tomentose on the edge, the outer glabrous, pinnatifid, with setaceous appendages, bordered with pedicellate glands, reflexed in flower, then erect and caducous. Calyx-tube oval, glabrous. Flowers *small*, *whitish*. Styles short, *glabrous*. Fruit *ovoid*, *black when ripe*.—Very near *R. sepium*, from which it differs by a different habit, by its small oval leaflets, its peduncles always solitary, not in a corymb, its glabrous styles, its small white flowers, and its smaller ovoid fruit."

Déséglise's No. 33 seems to be the most typical specimen in his herbarium, but even that has slightly hispid styles. It has slender straightish prickles, very small leaflets, $\frac{3}{8}$–$\frac{1}{2}$ in. long by $\frac{1}{4}$–$\frac{5}{16}$ in. broad, rather broader in proportion to their length than those of *R. sepium*, almost glabrous. Peduncles solitary, $\frac{5}{16}$–$\frac{3}{8}$ in. long. Fruit ellipsoid, $\frac{3}{8}$–$\frac{1}{2}$ in. long. Sepals all fallen. Styles very thinly hispid.

R. agrestis, being an older name, must take precedence of *R. sepium*, though the latter name appears to have been used more frequently in Britain. I am treating the two species separately because their segregation has usually been preserved on the Continent, but the modern tendency is to combine them, even Rouy and Keller, who make very fine-drawn distinctions between their species, now making the names synonymous. Déséglise has no British examples labelled *R. agrestis*, though I think that those who wish to preserve the distinction will find examples from Britain which agree with that species in their small subglabrous leaflets, small more or less ellipsoid fruit, and glabrous or subglabrous styles.

Rhodologists seem to have agreed to disregard Savi's characters of umbellate flowers and large fruit, 1 in. long. Déséglise, in fact, credits *R. sepium* with more clustered flowers than *R. agrestis*. Solitary flowers prevail in specimens attributed to either species, umbellate inflorescence being more rare, though apparently about

equally frequent in both species, while the larger fruited specimens are usually labelled *R. sepium*. Savi also says that the leaflets are hairy above, but does not mention hairs beneath. This would be most unusual in any rose, and, as a matter of fact, the leaflets in both species are sometimes quite glabrous, and sometimes, though more rarely, slightly hairy beneath.

Rosa sepium

Thuillier, Fl. des env. de Paris, p. 252 (1799).

"Rather tall. Branches armed all over with recurved prickles. Leaflets mostly seven, small, oval acute, with scattered glands beneath, as well as on petioles. Oblong-ovate fruit and peduncles smooth."

Déséglise's description in Ess. Monogr. p. 103 is as follows:—"A tall shrub, branched, with long pendent or erect branches, very prickly, with scattered unequal prickles, dilated at the base, recurved at the tip; petioles *charged with glands*, prickly beneath; leaflets 5–7, shortly petiolulate, the terminal longly so, acute at the base, *shining green*, *glabrous above*, *sprinkled with viscous glands beneath*, *obovate-lanceolate*, *acute at both ends*, serrate, with teeth charged with glands; stipules narrow, glabrous above, glandular beneath, auricles little diverging; peduncles glabrous, solitary or combined into a corymb, furnished at their base with *oval-acuminate glabrous bracts*, fringed with glands, shorter than the peduncles; sepals a little tomentose at the edges, glabrous, pinnatifid, with linear appendages, bordered with pedicellate glands, longer than the corolla, reflexed in flower, not persistent; calyx-tube glabrous, *oval-oblong*; styles *almost glabrous* or feebly hispid, disc almost flat; flowers white or rose; fruit *oblong-ovoid*, red.—It differs from *R. canina* by its glandular leaflets, viscous beneath, and its glandular petioles. It differs from *R. rubiginosa* in its less robust prickles, its leaflets acute at both ends, glabrous both sides, only charged with viscous glands beneath, its glandular, not glandular-pubescent petioles, and its peduncles and calyx-tube always glabrous, never hispid."

Déséglise has three small pieces of Thuillier's own gathering, which were given to him by Boreau. They are too scrappy to show prickle characters. Their leaflets are five, small, and narrowly elliptical, about $\frac{5}{8}$ in. long by $\frac{1}{4}$—$\frac{5}{16}$ in. wide, much narrowed at the base, somewhat less so at the apex, acute, finely biserrate, subglabrous or with a few scattered hairs and some fine glands above, thinly hairy chiefly on midrib, and finely glandular all over beneath. Petioles shortly and finely pubescent, rather densely glandular, with small acicles. Stipules pubescent, slightly glandular on back. Peduncles solitary, $\frac{1}{4}$ in. to $\frac{3}{8}$ in. long. Calyx-tube ellipsoid, about as long as the peduncles. Sepals $\frac{1}{2}$ in. to $\frac{5}{8}$ in., pinnate, smooth on back, somewhat glandular-ciliate, spreading-reflexed after fall of petals. Styles very slightly hispid. Fruit not formed. He also has a specimen which he has labelled as being identical with Thuillier's specimens. It has stout hooked

prickles. The leaflets are more acuminate, but otherwise similar, though more glabrous. The petioles are subglabrous, though strongly glandular. Peduncles 1–3, ¼ in. to 1 in. long. Fruit ellipsoid, ½ in. to ⅝ in. long. Sepals somewhat pinnate, spreading-reflexed after fall of petals, and deciduous by September 10th. Styles thinly hispid.

Unless it be in its larger size, more hooked prickles, and hispid styles, it is difficult to see how this species differs from *R. agrestis*. The habit may afford a character which is not apparent in herbarium specimens.

There are two specimens from Britain in Déséglise's herbarium in the cover of *R. sepium*. One is Mr. Baker's No. 34 from Luddenden, W. Yorks, referred to under *R. cryptopoda* (p 112). The other is by Messrs. Groves, from Puttenham, Surrey. It is unarmed. Its leaflets are five, 1 in. by ½ in., elliptical, narrowed at each end, almost or quite glabrous above, thinly hairy chiefly on midribs beneath, rather coarsely biserrate. Petioles very thinly pubescent, considerably glandular, with very small acicles. Stipules almost glabrous, and mostly eglandular, but some are glandular on back. Peduncles solitary, ⅝ in. to ¾ in. Fruit urceolate-ellipsoid, ½ in. by ¼ in. Sepals all fallen by September. This is very near, but I think not identical with, the specimen labelled *R. arvatica* Pug. referred to in my "*Eu-caninæ*," p. 25. I do not see any reason for Déséglise not having placed it to his *R. mentita* (see p. 129).

Mr. Baker, in Monogr. Brit. Roses, p. 233, originally took up the name of *R. pulverulenta* M. Bieb. for this species, but afterwards corrected it to *R. sepium* Thuill. His description and notes, however, are neither those of Bierberstein's nor of Thuillier's species, but of a much broader-leaved plant than the latter, with broader fruit, and much more hairy styles. From his mention of its similarity to *R. micrantha* and to *R. Borreri*, I think he must have had in his mind the plant called *R. inodora* Borr. (non Fries), which is quite distinct from *R. sepium*, though the true *R. inodora* of Fries belongs to the group of *R. agrestis*. The synonymy of *R. Klukii* Bess., quoted by Mr. Baker, adds to the confusion, as that is an *elliptica* form. Mr. Baker's specimens of *R. sepium* seem to be correctly labelled, but they do not at all agree with his description. The concluding sentence of his notes on "*R. pulverulenta*" (p. 224 *op. cit.*) seems to explain the matter, and the whole of the preceding part must be taken to apply to *R. inodora* Borr., which I think is synonymous with *R. Borreri* Woods.

Rosa inodora

Fries, Novitiæ Fl. Suec. p. 9 (1814).

"Oblong germen and peduncles glabrous. Stem very prickly. Leaves oblong, viscous, glandular beneath.—Very near *R. Eglanteria* Linn., but certainly distinct. With the consent, therefore, of Swartz, I put it forward as a new species.—Erect shrub, 4 to 8 ft. high, very spiny, the largest prickles recurved, white, dilated

at base. Petioles glandular, villous, prickly, prickles straightish. Stipules glandular-ciliate. Leaflets 5–7, oblong, unequally serrate, acuminate, flat, smaller than in *R. Eglanteria*, glabrous above or with adpressed hairs, glandular-rubiginose beneath, with straight resinous hairs, plainly scentless (*inodoris*). Peduncles lateral and terminal, solitary, quite glabrous. Flowers smaller than in *R. Eglanteria*. Germen oblong, glabrous. Calyx-leaves subglabrous, reflexed. Petals obovate, white. Fruit oblong-ovate, purple, smooth. Flowers in July."

There is a scrap from Fries at South Kensington. Its prickles are stout and hooked, though it only shows those near the end of the shoot. Its leaflets are rather small, elliptical, subobtuse, narrowed below, but not conspicuously so, densely glandular beneath. The peduncles are solitary, fruit ovoid, sepals spreading, somewhat hairy, but not glandular, and styles hispid.

There is much doubt, first, as to what Fries's species really is; secondly, whether we have it in Britain. Déséglise, who has seen specimens in Fries's herbarium, makes it synonymous with *R. sepium* Thuill. Keller, however, places it as one of the densely hairy varieties of that species, while Crépin (Bull. Soc. Bot. Belge xxi. p. 186) thinks it a variety with larger leaflets, broadly oval-elliptical, less narrowed at the base, midribs a little pubescent, the upper surface sometimes pubescent, but soon becoming glabrous, petioles glabrous or soon becoming so, fruit rather large, ovoid or roundish ovoid, and styles hispid. He adds that the leaves are not inodorous, as Fries states, but plainly scented, especially in damp weather. He has not seen anything from Britain to match it. I do not know whether he has seen the Brean Down plant mentioned below, but he says that the plant distributed by Mr. Bagnall from Whatcote, Warwickshire, is a form of *R. scabrata*. The Whatcote plant referred to has large, broadly oval leaflets, glabrous and thinly glandular all over beneath, peduncles in threes, almost 1 in. long, sepals reflexed with many broad pinnæ, and quite short hispid styles. It does not look at all like an *agrestis* form.

The first notice of this species as a British plant was made by Mr. Baker in Rep. Bot. Exch. Club for 1866, wherein he said a specimen from Brean Down, Somerset, of which he gave the following notes, resembled it very closely:—"Prickles falcate, uniform. Leaves doubly serrated, rather hairy above, more so and densely glandular beneath, measuring about 3 in. from the base to the apex of the terminal leaflet, which is elliptical or obovate, narrowed to the base, and measures about 15 lines long by 9 lines broad. Petioles hairy and densely setose. Stipules and bracts glandular and rather hairy on the back. Pedicels and gracefully ovate-urceolate calyx-tube quite naked. Sepals 8–9 lines long, naked on the back with a long narrow point, and two or three small linear gland-ciliated pinnæ on each side. Leaves in texture, shape, and glandulosity resemble those of *sepium*, not *canina*. From *sepium* it differs in its more robust habit, the larger size of all its parts, and the slight hairiness of its leaves, stipules, and

bracts. *R. sepium* and *R. inodora* come very near one another. *R. Borreri* Woods (*R. inodora* of Hooker and Borrer) differs from the true *inodora* Fries by its much less glandular and more herbaceous leaflets, which are rounded or even slightly cordate at the base, slightly glandular petioles, bracts, and stipules, and more early falling sepals."

The Brean Down specimen, which is in the Kew herbarium, has stout hooked prickles; leaflets five, the largest about 1 in. to $1\frac{1}{4}$ in. long, by $\frac{5}{8}$ in. wide, rather decidedly narrowed below, rounded or subobtuse at the apex, pubescent, often densely so above, and considerably so beneath, as well as thinly though conspicuously glandular, coarsely biserrate. Petioles densely pubescent, and glandular, with small but robust pricklets. Stipules rather densely pubescent and glandular on back. Peduncles 1–2, rather short (in bud stage). Sepals pinnate, not glandular on back, but hairy on appendages and pinnæ. Calyx-tube ovoid in young state. Styles rather densely hispid. There is no fruit. It seems to me to be intermediate between *R. sepium* and *R. Borreri*, and Mr. Baker's note at the end of his description sums up the situation very well.

There is so much variation among specimens labelled *R. inodora* Fries by continental collectors that they can hardly all represent the same species. Some have only inconspicuous glands on the midrib, while others are as glandular all over the lower surface as average *R. agrestis*. The leaflets also vary in size and shape. They are usually of medium or rather large size, never so narrow and cuneate-based as in *R. agrestis*, but, on the other hand, quite broadly oval and rounded at the base, much resembling those of *R. Borreri*, with which it may be regarded as forming a connecting link, in fact, Borrer's *R. inodora* (Brit. Fl. iii. p. 235) is certainly *R. Borreri*, though his var. γ may have been *R. agrestis*. Most of the specimens labelled *R. inodora* in Britain belong to *R. Borreri*, but Fries's name, if used in future, should be restricted to examples like that from Brean Down, *i. e.* forms of *R. agrestis* with somewhat hairy leaves and hispid styles, showing a divergence from the type in the direction of *R. Borreri*, but without its broad leaflets.

Rosa belnensis

Ozanon in Bull. Soc. Dauph. p. 326 (1881).

"Rather tall shrub with greenish or vinous branches. Prickles robust, dilated compressed at base, curved, those of the branches and branchlets straight or curved, unequal, some dilated compressed at base, others dilated into a disc-shaped base, often unarmed. Petioles *glandular*, *tomentose*, prickly beneath. Leaflets 5–7, medium, *oval-elliptical*, *acute at each end*, about $\frac{3}{4}$ in. to 1 in. long, by $\frac{3}{8}$ in. to $\frac{5}{8}$ in. wide, dull green, hairy and glandular all over beneath, with adpressed hairs above, doubly dentate, with glandular teeth. Stipules glandular above, scattered glandular beneath, glandular ciliate on edges, auricles acute, straight or

divergent. Peduncles solitary, or 2 to 4, glabrous, with oval acuminate or foliaceous bracts equalling or longer than the peduncles. Calyx-tube medium, ovoid, glabrous. Sepals appendiculate at apex, *glabrous on back*, with tomentose edges and glandular and hairy ciliate appendages, equalling the corolla, reflexed on green fruit, then deciduous. Styles short, glabrous or feebly hispid. Disc flat. Corolla about $1\frac{1}{4}$ in., white. Fruit medium, roundish ovoid or globose."

Specimens distributed by Ozanon have the stout prickles of the group. Their leaflets are oval or elliptical-oval, not always narrowed, in fact, sometimes rather decidedly rounded at base, less densely glandular than is usual in the group, but still conspicuously so. Toothing coarse, especially the primary. Petioles densely pubescent, considerably glandular, and rather more prickly than usual. Peduncles 1–3 or more, $\frac{1}{2}$–1 in. Fruit medium, globose. Sepals considerably pinnate, glabrous on back, except on pinnæ and appendages, which are hirsute, mostly fallen by middle of August, and all by mid-September. The styles vary from subglabrous to moderately hispid.

I have introduced this species into our list on the strength of a specimen gathered by the Rev. E. S. Marshall at Uphill, N. Somerset (No. 3103), and so named by Prof. Dingler. Its leading features are its more hairy leaflets, often hairy above, very pubescent petioles, and rather large subglobose or broadly ovoid fruit. I have seen very similar specimens from Witley, Surrey, and Llandudno, Carnarvon.

There are two or three other British forms which by their hairy leaves might be associated with *R. belnensis*.

R. agrestis var. *subcuneata* Rouy is a name which has been given by Prof. Dingler to examples from Llys-y-Gwynt, Carnarvon, and Hog's Back, Surrey, which differ in their somewhat less hairy leaflets, and ovoid-oblong or ellipsoid fruit. Its author brackets it with *R. arvatica* Pug., which he considers to differ in its broader leaflets and fruit. The latter species has already been mentioned in my paper on the *Eu-caninæ* (p. 24). It is a species over which there has been great confusion in Britain owing to Mr. Baker's description not fitting Puget's specimens and MS. but unfortunately unpublished description. Puget's name, however, is retained on the Continent to cover segregates of *R. agrestis* with larger, broader, and more hairy leaflets. Messrs. Groves's specimens from the Hog's Back, Surrey, agree very well with Puget's own specimens of *R. arvatica*, to which they were referred by Déséglise, but as Puget's name is an invalid one, they should be left for the present under an aggregate *R. belnensis*.

A specimen from Somerton, N. Somerset, collected by the Rev. E. S. Marshall (No. 3109) with the very small leaflets of *R. sepium*, but hairy, and with oblong fruit, has been named *R. agrestis* var. *elegans* by Prof. Dingler. It may be regarded as a very small-leaved form of *R. belnensis*.

One other example deserves notice, *viz.*, a plant from between

Glynde and Lewes, E. Sussex, collected by Jenner. It has hairy leaflets nearly 2 in. long by 1¼ in. wide. It appears to be *R. sepium δ pubescens* Rap. (Cat. Pl. Vasc. Gen. p. 73, 1861). It is very like *R. belnensis*, but has much larger leaflets.

Foreign Species of the Group R. agrestis.

In addition to the forms mentioned under *R. belnensis* Ozan., the following might be found in British herbaria:—

R. virgultorum Rip. has decidedly hispid styles, but with the other characters of the present group, to which it is placed by continental authors, rather than to that of *R. elliptica*, by reason of its tall stout growth. It has leaflets like those of *R. agrestis*, but dark green and glabrous, with glabrous but glandular petioles, and subglobose fruit.

R. mentita Déségl. is more or less unarmed. Its leaflets are rather large, oval or oval-lanceolate, coarsely toothed, glabrous and not very glandular beneath, with villous petioles. Fruit small, ovoid or ellipsoid, on long peduncles. Styles glabrous or almost so. It is near *R. arvatica* Pug., but the latter has smaller, more obovate leaflets, usually hairy on the midrib.

Recapitulation of the Sections and Groups.

It may be convenient to make a brief recapitulation of all the sections and groups of the genus as represented in Britain, which have been covered by my two papers published as Supplements to this Journal.

The following table gives the sections, subsections, and groups in the order in which they may best be arranged. I have added a further subdivision into subgroups, which differs somewhat from that followed in my papers, and which I think is an improvement.

SECTIONS	SUBSECTIONS	GROUPS	SUBGROUPS
Synstylæ		*Arvensis*	
Stylosæ		*Stylosa*	
Pimpinellifoliæ		*Spinosissima*	
		Pimpinellifoliæ × *Villosæ*	
Hybridæ		*Pimpinellifoliæ* × *Rubiginosæ*	
		Pimpinellifoliæ × *Eu-caninæ*	
Caninæ	*Eu-caninæ*	*Canina*	*Lutetianæ* *Transitoriæ* *Dumales* *Andegavenses* *Scabratæ*

SECTIONS	SUBSECTIONS	GROUPS	SUBGROUPS
Caninæ (continued)	*Eu-caninæ* (continued)	*Dumetorum*	*Dumetorum* *Deseglisei* *Canescentes*
		Glauca	*Reuteri* *Subcaninæ*
		Coriifolia	*Coriifoliæ* *Subcollinæ*
		Borreri	
	Villosæ	*Pomifera*	*Pomiferæ* *Molles*
		Sherardi	
		Tomentosa	*Tomentosæ* *Fœtidæ*
	Rubiginosæ	*Eglanteria* *Elliptica* *Micrantha* *Agrestis*	

Section *Synstylæ*.—The group *R. arvensis*, in so far as its type species is concerned, presents no difficulty, but others of the group, which have not been identified as British, though fairly frequent on the Continent, are not easily distinguished from members of the *Stylosæ* (see Brit. Ros. p. 2). *R. arvensis* Huds., its var. *scabra* Baker, and *R. ovata* Lej. seem to be inseparable; var. *biserrata* Crép., when well marked, is quite distinct, but intermediates occur; this var. and *R. erronea* Rip. seem to be very rare in Britain, as is also *R. gallicoides* Déségl. The true *R. dibracteata* Bast. is of doubtful occurrence in Britain, the large strong form of *R. arvensis* which is usually mistaken for it being *R. arvensis* var. *major* Coste.

Section *Stylosæ*.—Except for typical *R. systyla* Bast. which is fairly constant and easily recognisable, this group is connected on one side with that of *R. arvensis*, and on the other with *R. canina*, and I am unable to give any characters, either single or in combination, which will separate it from these two with certainty. Stout-based prickles, a long glabrous style column with a subcylindrical head of stigmas, and a conspicuously conical disc, are by no means always to be found in members of the group *R. stylosa*, while any or all of these characters may occur in the *Eu-caninæ*. I think that either some transfer of species from one group to the other is desirable, or that greater regard must be paid to the sectional characters in diagnosing specimens.

Of the species and varieties of this group, the commonest in Britain is *R. systyla* Bast., but *R. leucochroa* Desv. is locally quite equally so in the south-west. Var. *lanceolata* Lindl. is, I believe, frequent, but variations in the shape of the leaflets do not always coincide with those of the fruit. Typical *R. stylosa* Desv. appears to be quite rare, and its variety *corymbosa* Desv. is of

doubtful occurrence. Var. *evanida* Christ is at present confined to Ham Common, Surrey, and var. *pseudo-rusticana* Crép. is also a very local south-western variety, while *R. virginea* Rip., and perhaps some of the foreign species, may turn out to be more frequent than has been supposed, having been mistaken for *Eu-canina* forms.

Section *Pimpinellifoliæ*.—The group *R. spinosissima* is the best defined one we have, and quite unmistakable. *R. pimpinellifolia* Linn. is nothing but a smooth-peduncled variety of *R. spinosissima* Linn., though in Britain it is the commoner of the two. *R. Ripartii* Déségl. is a markedly biserrate variety which occurs on Barnes Common, Surrey, only, though intermediates are found elsewhere, and *R. mitissima* Gmel. is a mountain form. *R. rubella* Sm. is a species about which there has been much controversy, and I admit I cannot solve it. Probably Crépin's view that it was a mere sport is the correct one. I can make little of Wood's and Lindley's varieties, though if strength and direction of prickles and shape of leaflets be observed, we might divide our typical species into several varieties.

Section of *Pimpinellifoliæ* hybrids.—Though as a section these hybrids are usually easily recognised, there is, I fear, great confusion over their grouping. It is by no means so easy as it might be supposed to distinguish between hybrids of a *spinosissima* form, compounded with one of the *Villosæ*, from those with the *Rubiginosæ* or *Eu-caninæ*, and it is still more difficult to diagnose those formed from the various groups of those subsections, whilst the recognition of the species involved is almost impossible. The characters of the various forms of the hybrids, usually regarded as species, have been based with a disregard of those of the possible parents; moreover, the distinctions on paper have been much too finely drawn, *e.g.* between *R. Sabini*, *R. involuta*, and *R. Doniana*, while some of the other forms which have been named run too close to one another. An intimate acquaintance with the prevailing species in the neighbourhood, and of the habits and facies of the possible parents, might go far towards the solution of the origin of a given form at the time of gathering, but it should not be assumed that the commonest forms in any district are those most likely to form hybrids, moreover, habit is not as a rule observable in a dried specimen. Notes at the time of gathering are therefore almost indispensable.

Some of the hybrids with the *Villosæ*, in which the parent of that subsection prevails, are very difficult to distinguish from members of the subsection itself, while others run so near the *Spinosissimæ* that they might be taken for them, but the presence of hairs on the under surface of the leaflets will almost invariably mark the hybrids, while the very imperfect development of the fruit, and, in the majority of cases, the presence of acicles on the stem, at least in some part, should assist in diagnosing the whole section.

Section *Caninæ*. Subsection *Eu-caninæ*.—The group of *R. canina* is, as a rule, fairly easily recognisable, and in England, at

least in the South and Midlands, forms, with that of *R. dumetorum*, the largest portion of our Rose Flora. In the north it is replaced, in part at least, by the groups of *R. glauca* and *R. coriifolia*, and by the *Villosæ* subsection. Its members are sometimes with difficulty distinguishable from those of the *R. glauca* group, and, as has already been mentioned under the *R. stylosa* group, they sometimes bear the leading features of that section. The entire absence of hair, even from the midribs beneath the leaflets, seems to be the only certain distinction from the groups of *R. dumetorum*, *coriifolia*, and even *Borreri*.

Its subgroups are quite artificial, although they contain some of the oldest established species in the genus. The *Lutetianæ* have their leaflets quite uniserrate, without subfoliar glands, and with smooth peduncles. If the leaflets are eglandular, with their teeth all or mostly biserrate, and smooth peduncles, they belong to the *Dumales*, and the *Transitoriæ* come between them, having the lower leaflets of the flowering shoots mostly biserrate, and the upper uniserrate. The last-named subgroup is one that is now recognised by most continental rhodologists, and I find it a useful though perhaps not a very scientific barrier between the other two. *R. insignis* Déségl. will, I think, turn out to be a frequent British member of this subgroup. It has large, often glaucous leaflets, longly acuminate, and frequently more or less narrowed below, rather large ovoid or subellipsoid fruit, hispid styles and often rising sepals. *R. globularis* Franch., *R. syntrichostyla* Rip., var. *ramosissima* Rau, and *R. viridicata* Pug. are also members of this subgroup.

Glandular-hispid peduncles, sometimes very slightly so, and leaflets without subfoliar glands are the leading features of the *Andegavenses* subgroup, while strongly biserrate leaflets with subfoliar glands on the secondary nerves distinguish the *Scabratæ*. All five subgroups contain members very difficult to separate from one another, since the characters assigned to the different organs, as distinguishing features, do not always occur in the combinations specified. For this reason, as well as on account of the striking similarity between species which are now assigned to quite different groups or subgroups, because of their technical characters, it has occurred to me that an entirely new system of grouping might be adopted, dropping the present groups and subgroups altogether, and regarding variations in serration, the presence or absence of hairs, or glands, either on the leaflets or the peduncles, and similar characteristics, as varietal ones only. Our species of the *Eu-caninæ* might thus be reduced to quite a few, but each would have several, and perhaps some a considerable number of, varieties. This would of course be a bold step, and the determination of the specific characters might give some trouble, but it would be more scientifically correct than the modern method of distinguishing species, which are practically identical, simply because, for example, one has a few hairs on the midrib which are absent in the other.

The group *R. dumetorum* contains three, or perhaps four, sub-

groups, the typical one covering those species with uniserrate leaflets and smooth peduncles, that of *Deseglisei* having the latter hispid. The *Canescentes* have biserrate leaflets and smooth peduncles, while there is a fourth subgroup having biserrate leaflets and hispid peduncles, to which I have placed *R. cæsia* Sm. and *R. Lucandiana* Déségl. I feel sure now that *R. cæsia* Sm. should be referred to the group of *R. coriifolia*, while *R. Lucandiana* Déségl. is a very rare species of which I have seen too little material, but which I think may very likely belong to the same group, so that there is no British representative of this fourth subgroup of *R. dumetorum*. The whole group is liable to be mistaken for that of *R. coriifolia*, while the members of the *Deseglisei* subgroup may be confounded with those of the *Stylosæ*. The absence of subfoliar glands should suffice, in most cases, to prevent confusion with the *R. Borreri* group.

Though I have not much improved my knowledge of *R. obtusifolia* Desv. since I wrote my paper on the *Eu-caninæ*, I still think it best placed in the present group. Prof. Dingler places very similar looking plants to either *R. obtusifolia* or *R. dumetorum*, while M. Sudre appears to distinguish *R. obtusifolia* solely by its white flowers, even specimens which closely resemble *R. tomentella* in habit, shape of leaflets, &c., but uniserrate and eglandular, being named by him *R. dumetorum*, in the absence of information as to the colour of the flowers.

The group *R. glauca*, in so far as its typical forms are concerned, is a fairly distinct one. The short peduncles, rising sepals, and, above all, the flattish head of very woolly styles, are marked features, but all these may occur, collectively or individually, in the group of *R. canina*. In the subgroup *Subcaninæ* the sepals are reflexed. This subgroup does not appear to have been fully worked out. It may contain species with either simply or doubly serrate leaflets, also with either smooth or glandular-hispid peduncles. Its representatives are, I think, fairly frequent in Britain, but are often referred to other groups.

The *R. coriifolia* group bears much the same relationship to that of *R. glauca* as *R. dumetorum* does to *R. canina*. If I am right in referring *R. cæsia* Sm. to it, that species should replace *R. coriifolia* as the type of the group, since *R. cæsia* Sm. antedates *R. coriifolia* Fries by three years. The members of the group are often with difficulty separable from some of the *Villosæ* section, as well as from the *R. Borreri* group. In general, the much smaller prickles will separate it from both these, while their being much hooked will distinguish it from the *Villosæ*. The *Subcollinæ* have reflexed sepals, and correspond to the *Subcaninæ* of the *R. glauca* group. Mr. Barclay makes a new species, *R. subcoriifolia* (Ann. Scot. Nat. Hist. July, 1899, p. 172), which seems to me to be too near *R. cæsia* var. *incana* Borrer (*R. tomentosa* var. *incana* Woods). In any case, the name could not be adopted for the subgroup, if the rule of taking the oldest be followed, as *subcollina* Christ is older, while if my idea that *R. cæsia* belong here be correct, that name should stand at the

head of the subgroup. *R. pruinosa* Baker and var. *Lintoni* Scheutz also belong to this subgroup.

The *R. Borreri* group is a fairly compact one. Strongly biserrate, suborbicular or broadly oval, pubescent leaflets, usually but not always glandular on secondary nerves beneath, and with broad, well-developed sepal pinnæ, are its leading features. Stout, hooked prickles are usually assigned to it, but they are by no means a constant feature; they are generally much hooked, but not necessarily stout. I think the large strong forms belong to *R. Borreri* Woods, whether the peduncles are slightly glandular or not, while the dwarf compact forms must go to *R. tomentella* Lém., those with strongly glandular peduncles being referred to var. *decipiens* Dum. The other species of the group are obscure.

Subsection *Villosæ*.—This is without doubt our most unsatisfactory subsection, and one that is most in need of complete revision. The adoption of the relative persistence of the sepals as the main feature on which the subdivision into groups is based, in which I have followed the lines taken by the Rev. A. Ley in his paper on the "*Mollis-tomentosa* group" in this Journal for 1897, is not in accordance with the plans followed by Continental authorities. This in itself is no reason why our plan is not the better one, but it certainly has the effect of bringing incongruous plants together, and of separating those which are obviously closely allied. I do not wish it to be inferred that I regard the persistence or otherwise of the sepals as unimportant. There is a very wide and important difference between the persistent sepals, say, of *R. mollis* Sm. and the deciduous ones of *R. scabriuscula* Sm., but it is in the intermediate group of *R. Sherardi* that the difficulty occurs. It is at any rate a very inconvenient primary character from which to decide the group to which a dried specimen should be referred, unless its fruit be in exactly the right condition.

The members of the *R. pomifera* group should be distinguished at once from the other two by their habit. They are low-growing bushes having erectish stems, with straight internodes, the flowering branches being closely arranged round the stem in a cylindrical form, which is as a rule conspicuous from a little distance. This cylindrical arrangement of the flowering branches is not met with in the other groups. To say that the habit is compact hardly conveys the correct impression. I have made use of two subgroups, *viz.*, those of *Pomiferæ* and *Molles*, the former being distinguished by its larger, thinner, much more oblong, *i.e.* parallel-sided leaflets. It is questionable whether *R. recondita* Pug. should be retained at all; it is at best only a more glandular form of *R. pomifera* Herrm., which in itself may bear quite numerous subfoliar glands. *R. Grenierii* Déségl. is an obscure species connecting the two subgroups. *R. mollis* Sm. abounds in glandular-leaved forms, which do not appear to have received special names, but are quite distinct from *R. pseudo-rubiginosa* Lej., which is quite a rare species. The distinction between *R. mollis* and var. *cærulea* Woods is not at all clearly marked.

The group of *R. Sherardi* might, I think, with advantage be

reduced in size, several of its members being transferred to that of *R. tomentosa*. But further study is necessary before deciding where to draw the line. Perhaps *R. omissa* Déségl. and *R. resinosoides* Crép. should form a group by themselves, the remainder going into the *R. tomentosa* group. The idea of forming the *R. Sherardi* group arose from the existence of *R. omissa* Déségl., which occupies a position just intermediate between *R. mollis* and *R. tomentosa*, but by basing the group mainly upon the relative persistence of the sepals, which is only one of several leading features of *R. omissa*, it has resulted in the collection together of a number of species and varieties which have little in common, and which have always been regarded on the Continent as *R. tomentosa* forms, and unless very strong reasons can be adduced for making a change, it is better, or at least more convenient, to work on the same lines as our continental contemporaries.

Of its members, *R. omissa* is a difficult species, to forms of which some of our plants may no doubt be referred, but I have not seen the typical plant from Britain. *R. resinosoides* Crép. is very near it, but forms a connecting-link with var. *pseudo-mollis*, and through it with var. *submollis* Ley, *R. Sherardi* Davies, and var. *uncinata* Lees, so that it is difficult to say where the line should be drawn before the *tomentosa* forms. There certainly seem to be two forms which have been labelled *R. subglobosa* Sm. or its older name *R. Sherardi* Davies. Both these are placed under *R. tomentosa* Sm. on the Continent, as well as, until recently, in this country, but I think it probable that one of the forms should be associated with *R. omissa* and the other with *R. tomentosa*. Var. *uncinata* Lees seems to me to be a hooked-prickled form of a quintet of very closely allied species or varieties, the other four members of which are *R. resinosoides* Crép., *R. Sherardi* Davies, var. *submollis* Ley, and var. *pseudo-mollis* E. G. Baker. There are several uniserrate leaved forms, which do not all fit the description of *R. cinerascens* Dum., while the smooth-peduncled forms do not as a rule fit that of *R. farinosa* Rau, but neither of these series of forms have received definite names. The forms might be reduced in number if less notice be taken of the degree of persistence of the sepals. *R. suberecta* Ley seems to be distinct, and with its var. *subglabra* is quite as worthy of group distinction as *R. Sherardi* or even *R. omissa*, but on the whole they seem best united to the group of *R. tomentosa*, and var. *Woodsiana* Groves might go with them as a second variety. The last-mentioned variety was wrongly stated by me on p. 80 to have been first discovered by Mr. Nicholson; the credit for its first finding must be given to the Messrs. Groves.

The group of *R. tomentosa* may be divided into two subgroups. That of *Tomentosæ* contains *R. tomentosa* Sm., *R. cuspidatoides* Crép., and *R. pseudo-cuspidata* Crép., which are distinguished from the second subgroup mainly by their more tomentose leaves and villous styles. Most of the transfers it may be desirable to make from the group of *R. Sherardi* would fall into this, and there appear to be several allied forms, which have not received

special names, nor have been satisfactorily identified with the continental ones, so that this subgroup is likely to become an unwieldy one. There are, for example, both glandular and eglandular leaved forms of *R. tomentosa* Sm., the latter not agreeing with either *R. cuspidatoides* Crép. nor *R. pseudo-cuspidata* Crép. Some of its members are liable to be mistaken for those of the *R. coriifolia* group or *vice versa*, as has been done with *R. tomentosa* var. *obovata* Baker, which is almost certainly a *coriifolia* form. The subgroup of *Fœtidæ* contains the more glabrous-leaved and glabrous-styled species, *viz. R. fœtida* Bast., *R. scabriuscula* Sm., "*R. Jundzilliana* Baker, non Bess.," and *R. tomentosa* var. *sylvestris* Woods. To these must be added, I think, *R. confusa* Pug., which is the best name that can be given to the glandular forms of *R. scabriuscula* Sm., while *R. subcrecta* Ley with its var. *glabrata*, and *R. tomentosa* var. *Woodsiana* Groves, are best at home in this subgroup, in spite of their much more persistent sepals, and hairy styles.

Subsection *Rubiginosæ*.—This is a fairly natural and distinct subsection, though its less glandular members sometimes make a close approach to the *Villosæ*, or to the groups *R. Borreri* or *R. coriifolia*. In the field, however, the strong scent of their glands should distinguish them.

Almost the whole of our British species fall into the two groups of *R. Eglanteria* and *R. micrantha*, which are more easily distinguished in the field by their habit than in the herbarium by technical characters, but those given on p. 101 should, as a rule, suffice to place herbarium specimens in their proper group. Of our own species, *R. jenensis* M. Schulze is very distinct by its smooth peduncles, while the armature of var. *rotundifolia* Rau will mark that off. The rest of the group may be regarded as aggregate *R. Eglanteria* Linn., consisting of a series of forms not readily separable.

The group of *R. elliptica* in Britain is reduced to *R. Billietii* Pug. which I do not think has been found except at Annesley, and *R. cryptopoda* Baker, which is suspiciously near the *R. coriifolia* group.

The group of *R. micrantha* is formed mainly of the inseparable species *R. micrantha* Sm. and *R. permixta* Déségl., which are generally distributed and common on calcareous soils. *R. hystrix* Lém. is a rarer species, which has well-marked features, while *R. sylvicola* Déségl. and *R. micrantha* var. *Briggsii* Baker are very local.

The group of *R. agrestis* consists of *R. agrestis* Savi and *R. sepium* Thuill., which are practically synonymous, and in the aggregate form a somewhat rare British species, to which *R. belnensis* Ozan. approaches as a more hairy-leaved form. Much of our material which has been labelled *R. sepium* Thuill. or *R. agrestis* Savi may perhaps be referred to *R. inodora* Fries, which is a species that has been much misunderstood in Britain.

Concluding Remarks.

It will be felt, I fear, that not only have I done nothing original, but that I have left the genus in confusion, owing to my recapitulatory remarks departing in a great measure from the plan of grouping I had at first followed. Both arguments are true. I have not studied Roses for a sufficiently long period to do any original work on them, though I have indicated places where alterations or improvements might be made. I have especially avoided the creation of new names or new combinations, because of the uncertainty, not only as to the synonymy of our names with those in use on the Continent, but also as to whether forms new to me have already been named and described. I may have erred in the other direction by continuing the use of such names as *R. Jundzilliana*, the plant to which that name has been applied in Britain being certainly not Besser's. Again, *R. tomentosa* var. *obovata* is, I feel sure, not a *tomentosa* form at all, but a *coriifolia*, but before renaming it *R. coriifolia* var. *obovata*, I should like to be quite sure that it has not already received a name on the Continent.

I do not wish to say anything that would tend to discourage present and future workers in the genus, but it is impossible to avoid the conclusion that *Rosa* is the most difficult one we have. In *Rubus*, the largest critical genus I have studied at all, I found that I soon became acquainted at sight with the leading species of my own neighbourhood, but it is not so with *Rosa*. This may be partly due to the great difficulty I have in obtaining authentic names from trustworthy sources, either in this country or abroad, so that my advance in knowledge is slow, but it is also due to the fact that bushes which look alike often prove on examination to belong to different species or even groups, while plants which look widely different in the field come together by their technical characters. It is the latter which I think are at fault. Too much stress may be laid upon variations in dentition, clothing, size of leaflets, form of prickles, &c., while the natural affinities deduced from habit and geographical distribution may be lost sight of. These latter are, of course, more difficult of observation, and herbarium specimens do not carry such characters on their faces, but I am sure that no satisfactory system of grouping can be arrived at by following technical characters only. These, of course, have their value, and some of them are of primary importance; moreover, nothing more convenient could be made use of as an artificial arrangement suitable for a herbarium, but it results in incongruities.

I do not think it of great importance whether we have few or many species in our list, but there is no doubt that we have a considerably larger number of forms than have so far received names in Britain; these are quite distinguishable and worthy of distinction, probably as varieties only, to which rank several of our species should also be reduced. It is our duty to bring ourselves into line with continental botanists, and to determine what these unnamed forms are, as well as to decide on the limits of the forms for which we have names.

An entirely revised list of county records will be required. Until there is more certainty as to what names our forms should bear, it will be difficult, if not impossible, to make a satisfactory list of their comital distribution. I have not been able therefore, to keep more than a very few. To judge from specimens I have seen at South Kensington labelled as new county records, many of those hitherto noted have been based upon most doubtful and some upon quite wrongly named material.

This question of satisfactory herbarium material is one that may give rise to difficulties for future workers. Déséglise's herbarium is a very large one, but it is almost bewildering to see the very large amount of variation in the contents of one species cover, so that it is impossible, in many cases, to decide which specimens, if any, are typical. Miss Willmott, of Warley Place, Great Warley, Essex, is making as complete a collection as possible in her garden of growing specimens of British forms, which will, it is hoped, prove invaluable for study, especially as they are being grown, as far as posssible, nnder natural conditions, without special attention to the soil. Miss Willmott will be glad to receive cutting of any *named segregates*, especially of the *Villosæ*, though any would be acceptable.

In addition to a considerable number of the *Eu-caninæ* which are being grown in the Warley Gardens, I am depositing in the National Herbarium at South Kensington duplicates of the Roses I have collected during the past two years. It is hoped that others will do the same, so that in time a good representative collection will be made of our British forms, both growing and in the herbarium. It should be pointed out, however, that unnamed examples, or those labelled with an aggregate name only, are of little value.

INDEX.

Names of sections, subsections, and groups in small capitals.
,, ,, British species and varieties in ordinary type.
,, ,, foreign ,, ,, ,, ,, italics.

PAGE

AGRESTIS 122
agrestis *Savi* 122
,, v. elegans *Rouy*..... 128
,, v. subcuneata *Rouy* ... 128
anceps Bout. 19
Andrzeiovii Stev. 66, 87
annesiensis Déségl. 86
apricorum *Rip.* 102
arduennensis *Crép.* 64
armatissima Déségl. & Rip. ... 48
arvatica *Pug.* 125, 128
ARVENSIS 2
arvensis *Huds.* 3
v. biserrata *Crép.* 5
v. major *Coste* 8
v. scabra *Baker* 4
v. setosa *Bagn*..... 6
× *sempervirens* 8
× spinosissima..... 6
× stylosa 9

belnensis *Ozan.* 127
bibracteata *Bast.* 7
× spinosissima ... 6
Billietii *Pug*..... 110
biturigensis *Bor.* 48
Briggsii *Baker* 119
,, *Gand.* 4
britannica *Déségl.* 97

CANINÆ 51
cheriensis Déségl. 113
chlorantha Sauz. & Maill. 19
cinerascens *Dum*..... 83
Ciphiana *Sibb.* 22
collina *Jacq.* 15
collivaga Cott. 87
comosa *Rip.* 103
comosella Déségl. & Ozan....105, 109
confusa Pug..... 99
consimilis Déségl. 25
conspicua Bor..... 8
coronata Crép..... 41
v. *subnuda* Crép.... 38, 41

PAGE

cryptopoda *Baker* 111
cuspidata M. Bieb. 91
cuspidatoides *Crép.* 91, 92

Desvauxii *Baker* 11
dibracteata *Bast.*..... 7
dolorosa Déségl. & Ozan. 105
Doniana *Woods* 31
dumosa Pug..... 99

echinocarpa *Rip.* 105
Eglanteria *Linn.* 101
ELLIPTICA 109
erratica Rip..... 13
erronea *Rip.* 5
EU-CANINÆ × PIMPINELLIFOLIÆ 41
evanida *Christ* 18

farinosa *Bechst.* 84
farinulenta Crép. 99
fastigiata *Bast.* 12
fœtida *Bast.* 95

gallicoides *Déségl.* 5
gracilescens *Baker* 36
gracilis *Woods* 32
Grenierii *Déségl.* 63

hibernica *Templeton* 42
,, v. cordifolia *Baker* 44, 46
,, v. glabra *Baker* 44
,, v. Grovesii *Baker* ... 45
hystrix *Lém.*..... 117

immitis Déségl. 19
inodora *Fries* 125
,, *Hook.* 127
intromissa Crép. 86
involuta *Sm.*..... 27
,, *Winch* 35
,, v. gracilescens *Baker* 36
,, v. lævigata *Baker*..... 37
,, v. Moorei *Baker* 50
,, v. Nicholsonii *Crép*.... 49

	PAGE
involuta v. occidentalis *Baker*	40
„ v. Robertsoni *Baker*...	34
„ v. Smithii *Baker*	28
„ v. Webbii *Baker*	37
jenensis *M. Schulze*.....	108
Jordani Déségl.	113
Jundzilliana *Baker*	96
Klukii Bess.....	118
lævigata *Baker*.....	37
Lemanii *Bor.*	117
leucantha *Loisel*	10
leucochroa *Desv.*	13
lugdunensis Déségl.	113
Mathonneti Crép.	26
mentita Déségl.	129
MICRANTHA	113
micrantha *Sm.*..... 114,	117
„ v. Briggsii *Baker* ...	119
mitissima *Gmel.*	23
mollis *Sm*.....	59
mollissima *Fries*	61
„ v. glabrata *Fries* ...	82
Moorei *Baker*	50
myriacantha DC.	26
nemorosa *Lib.*	114
Nicholsonii *Crép*.....	49
omissa *Déségl.*	71
„ v. submollis *Ley*	73
operta Pug.	122
ovata *Lej.*	4
Ozanonii Déségl.....	26
parvula Sauz. & Maill.....	19
permixta *Déségl.*	116
PIMPINELLIFOLIÆ	20
pimpinellifolia *Linn.*	22
„ v. inermis *DC.*	23
„ × *alpina*... ...	24
„ × RUBIGINOSÆ	48
„ × VILLOSÆ	26
POMIFERA	54
pomifera *Herrm.*	55
pseudo-cuspidata *Crép.* 91,	92
pseudo-mollis *E. G. Baker*.....	75
pseudo-rubiginosa *Lej.*	64
pseudo-rusticana *Crép.*	15
„ *Kell.*	9
pulverulenta M. Bieb.....	125
recondita *Pug.*	57
repens *Scop.*	3
reptans Crép.	5
resinosa Sternb. 66,	77
resinosoides *Crép.*	76
reversa Waldst. & Kit.	26
Ripartii *Déségl.*	22
Robertsoni *Baker*.....	34
rubella *Sm.*	24
RUBIGINOSÆ	100
rubiginosa *Linn.* 101,	103
„ v. *albiflora* Kell. ...	109
„ v. *Gremlii* Christ ...	109
„ v. *Moutinii* Crép....	109
„ v. rotundifolia *Rau*	107
rusticana Déségl.	8
sabauda Rap.	47
Sabini *Woods*	29
„ v. Robertsoni *Baker* ...	34
scabriuscula *Sm.*	93
Schultzii Rip.	47
sempervirens × *arvensis*	8
„ × *stylosa* 8,	9
sepium *Thuill*.....	124
„ v. pubescens *Rap.*	129
seposita Déségl.	20
septicola Déségl.	122
setosa *Bagn.*.....	6
SHERARDI	67
Sherardi *Davies*	69
SPINOSISSIMA	20
spinosissima *Linn.* 21,	22
„ v. aculeatissima *Woods*	21
„ v. pilosa *Lindl.* 21,	40
„ v. platycarpa *Lindl.* ...	21
„ v. pusilla *Woods*.....	21
„ v. reversa *Lindl.*	21
„ v. turbinata *Lindl.* ...	21
spreta Déségl.	25
STYLOSÆ.....	9
STYLOSA	9
stylosa *Desv*.....	10
„ v. corymbosa *Desv.* ...	11
„ v. Desvauxiana *Ser.* ...	11
„ v. Desvauxii *Baker* ...	11
„ v. evanida *Christ*	18
„ v. gallicoides *Baker* ...	6
„ v. opaca *Baker*	11
„ v. pseudo-rusticana *Crép.*	15
suberecta *Ley*	81
„ v. glabrata *Ley*	82
subglobosa *Sm*.....	69
submollis *Ley*	73
sylvestris *Lindl.*	97
sylvicola *Déségl. & Rip.*.....	120
SYNSTYLÆ	2
systyla *Bast*.....	12
„ v. lanceolata *Lindl.* ...	13

	PAGE
TOMENTOSA	87
tomentosa *Sm.*	88
,, v. *globulosa* Rouy...	87
,, v. obovata *Baker* ...	98
,, v. pseudo-mollis *E. G. Baker*	75
,, v. sylvestris *Woods*	97
,, v. uncinata *Lees* ...	78
,, v. Woodsiana *Groves*	80
tristis Kern.	86
tunoniensis Déségl.	87
umbellata Leers.	109
uncinata *Lees*	78
VILLOSÆ	52
villosa *Linn.*	57
,, v. cærulea *Woods*	62
,, v. suberecta *Woods* ...	66, 82
virginea *Rip.*	16
virgultorum Rip.	129
Webbii *Baker*	37
Wilsoni *Borr.*	38
Woodsiana *Groves*	80

PRINTED BY WEST, NEWMAN AND CO., HATTON GARDEN, LONDON, E.C.